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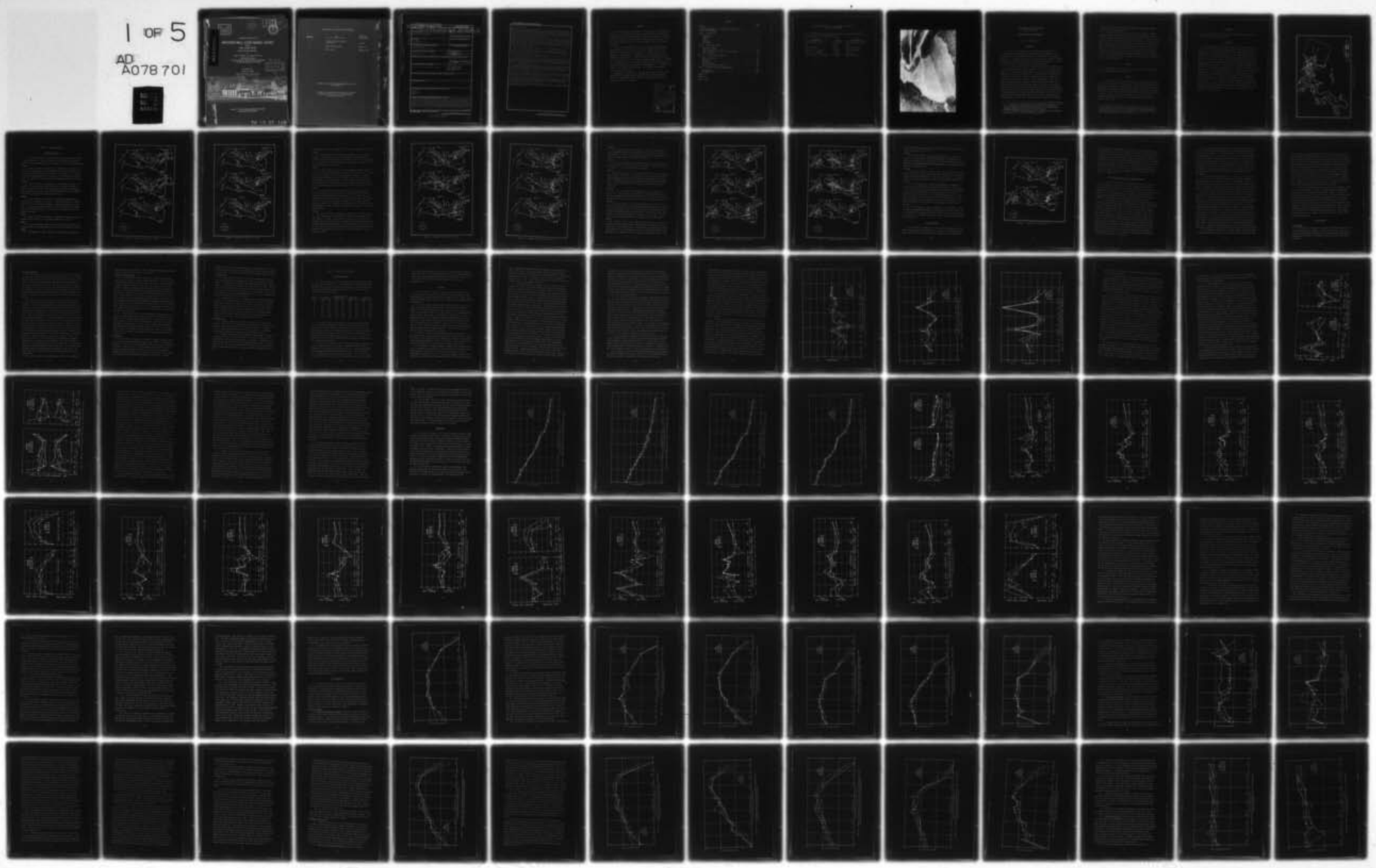

TECHNICAL REPORT HL-79-12

MAYPORT-MILL COVE MODEL STUDY

Report 3

MILL COVE STUDY

Hydraulic Model Investigation

by

Noble J. Brogdon, Jr., Joseph W. Parman
Hydraulics Laboratory
U. S. Army Engineer Waterways Experiment Station
P. O. Box 631, Vicksburg, Miss. 39180

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Report 3 of a Series

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MAYPORT-MILL COVE MODEL STUDY REPORTS

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A fixed-bed model of Mayport-Mill Cove constructed to scales of 1:500 horizontally and 1:50 vertically, reproduced a portion of the Atlantic Ocean adjacent to the entrance and the St. Johns River upstream to Hibernia Point. The purpose of the model study was twofold: (a) to investigate the effects of proposed improvement plans for the Mayport Naval Basin area on existing shoaling rates, hydraulics, salinities, and flushing; and (b) to investigate the effects of proposed improvement plans in the Mill Cove area on flushing, hydraulics, salinities and channel shoaling. The model study was conducted in three phases: phase 1 involved the model verification tests; phase 2 involved the Mayport Naval Basin Study; and phase 3 involved the Mill Cove Study. Phase 3 is reported herein; phases 1 and 2 are reported in Reports 1 and 2 of this series.

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20. ABSTRACT (Continued).

The model verification tests described in Report 1 indicated that the model hydraulic and salinity regimes were in satisfactory agreement with those of the prototype for comparable conditions. Model verification also included a comprehensive shoaling verification of shoaling rates and patterns in the navigation channel and Mayport Naval Basin. During the shoaling verification, model operation procedures were developed by trial and error to achieve satisfactory reproduction of observed prototype shoaling distribution patterns within the various reaches of the navigation channel and in Mayport Basin. This report contains the results of tests conducted for phase 3 of the study.

Based on visual observations and analysis of surface current pattern photographs conducted for 20 proposed plans, 3 plans (15, 18 and 20) were selected for further, more extensive testing. Each of the three plans involved an enlarged weir opening 1,300 ft wide by 12 ft deep at msl and the relocation of approximately 1,400 ft from the west end of the disposal island located off Reddie Point to the east end of the disposal island. Plan 15 included the above weir and disposal island changes in addition to the construction of a triangular-shaped island inside Mill Cove. Plan 18 involved only the above weir and disposal island changes. Plan 20 included the above weir and disposal island changes in addition to an enlargement of Quarantine Island into Mill Cove. 4

Each of the three plans resulted in minimum effects to tide levels in Mill Cove or in the immediate surrounding area. The greatest effect on tides was the rate of filling and emptying of Mill Cove.

Effects of the three plans on maximum current velocities in the navigation channel were minimal. Maximum currents, both in the ebb and flood direction, were increased slightly downstream from the weir opening and upstream from Reddie Point for each plan. Maximum currents in the reach of the river parallel to Mill Cove were decreased slightly with each plan.

Each plan increased the extent of crosscurrents in the navigation channel near the Mill Cove weir opening; however, navigation through this area should be no problem.

Maximum currents throughout the cove in both the flood and ebb direction were considerably higher than those observed during base tests. Each plan resulted in average maximum current velocities through the cove generally about twice the magnitude of those observed during base tests. Maximum currents associated with plan 15 (triangular-shaped island inside cove) would be in the range that would tend to cause scour problems in the area between the proposed island and Quarantine Island. Thereby requiring bank and bottom protection to prevent development of adverse scour.

Each of the three plans tested extensively resulted in slack periods and ebb and flood phases generally more in agreement with those observed in the adjacent navigation channel. Surface current pattern photographs showed that each plan caused a marked improvement in flushing of the cove. Generally, each plan is similar in the middle and western end of the cove. In the extreme southeast area, an area having the poorest circulation, plan 15 appears to improve flushing in a larger percentage of the area best of the three plans. Plan 20 is slightly better than plan 18.

Each plan resulted in increases in salinity levels in Mill Cove. Plan 18 increases were the greatest, with plan 15 next. Plan 20 increased average salinities the least of the three plans, and was more uniform throughout the cove. Maximum salinity increases occurred in the central portion of the cove; changes became progressively less near the weir and extreme western end of the cove.

Generally, each of the three plans resulted in very similar and minimum effects on dye concentrations along the navigation channel resulting from dye released in Mill Cove and at Mathews Bridge. In general, however, concentrations for plan 18 were less than base conditions while those for plan 15 and 20 were higher than base conditions. Plan 20 indicated a slightly better flushing ability than either plan 15 or 18, particularly in the extreme eastern end of the cove.

Minimum changes to overall shoaling rates and patterns would result from any of the three plans tested extensively. Effects of each plan were similar and generally within the limits of accuracy in repeating identical tests of this type.

PREFACE

This report is the third report to be published on the results of model tests on the Mayport-Mill Cove estuary model (St. Johns River) conducted for the U. S. Army Engineer District, Jacksonville. Report 1 covers the hydraulic, salinity, and shoaling verification phase of the model investigation; Report 2 covers the Mayport Naval Basin phase of the study.

This study was conducted at the U. S. Army Engineer Waterways Experiment Station (WES) during the period December 1977 to August 1978 under the supervision of Messrs. H. B. Simmons, Chief of the Hydraulics Laboratory; F. A. Herrmann, Jr., Assistant Chief of the Hydraulics Laboratory; R. A. Sager, Chief of the Estuaries Division; G. M. Fisackerly, Chief of the Harbor Entrance Branch; and N. J. Brogdon, Jr., Project Engineer. Technicians of the Estuaries Division who assisted throughout the investigation included Messrs. J. W. Parman, D. M. White, D. M. Stewart, and Ben Brown. This report was prepared by Messrs. Brogdon and Parman.

Commanders and Directors of WES during the course of this investigation and the preparation and publication of this report were COL John L. Cannon, CE, and COL Nelson P. Conover, CE. Technical Director was Mr. F. R. Brown.

CONTENTS

CONVERSION FACTORS, U. S. CUSTOMARY TO METRIC (SI)
UNITS OF MEASUREMENT

U. S. customary units of measurement used in this report can be converted to metric (SI) units as follows:

Multiply	By	To Obtain
cubic feet per second	0.02831685	cubic metres per second
feet	0.3048	metres
feet per second	0.3048	metres per second
gallons (U. S. liquid)	3.785412	cubic decimetres
miles (U. S. statute)	1.609344	kilometres
square miles (U. S. statute)	2.589988	square kilometres

Figure 1. The model

MAYPORT-MILL COVE MODEL STUDY

MILL COVE STUDY

Hydraulic Model Investigation

PART I: INTRODUCTION

Background

1. In order to investigate two separate problem areas in the St. Johns River, a model study was sponsored by the Department of the Navy and the U. S. Army Engineer District, Jacksonville. This report (Report 3) is concerned with the Mill Cove Study area; Report 1* covered the hydraulic, salinity, and shoaling verification; and Report 2 covered the Mayport Naval Basin study phase of the investigation.

2. Mill Cove, located about 4 miles** northeast of Jacksonville, is a shallow area about 5.5 miles long and 0.5 to 2.0 miles wide located adjacent to the St. Johns River (Figure 1). The cove is a natural silt trap, parts of which have been made more effective by the construction of certain features of the Federal Navigation Project to Jacksonville Harbor. These features, completed in the early 1950's, consist of the Dame Point-Fulton Cutoff navigation channel and the South Dike with a fixed weir opening, 150 ft wide with bottom elevation of -12 ft mean sea level (msl). Mill Cove has the potential of being a very important water resource to the Jacksonville area, particularly in regard to water-oriented recreation. However, continued shoaling in the cove since the construction of the Dame Point-Fulton Cutoff channel has resulted in water depth of 2.0 ft or less. Other problems include possible damage

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* N. J. Brogdon, Jr., "Mayport-Mill Cove Model Study; Hydraulic, Salinity, and Shoaling Verification; Hydraulic Model Investigation," Technical Report HL-79-12, Report 1, Jul 1979, U. S. Army Engineer Waterways Experiment Station, CE, Vicksburg, Miss.

** A table of factors for converting U. S. customary units of measurement to metric (SI) units is presented on page 3.

to shoreline property, which reduces aesthetic values, and stagnant conditions during summer months.

3. A model study* of the St. Johns River (Jacksonville Harbor) navigation project was conducted at the U. S. Army Engineer Waterways Experiment Station (WES) during the period 1945-1947. During the course of the model study the primary concern was elimination of adverse navigation conditions in the natural channel between Fulton and Dame Point. This was accomplished by the construction of a dike across Back River north of the cutoff and a dike and opening across Back River south of the cutoff at the mouth of Mill Cove. The purpose of the opening was to provide a navigation passage for small craft and tidal circulation in the cove. Detailed studies of tidal flow and circulation conditions were not made at that time.

Purpose

4. The purpose of this report is to assist in the development of plans to improve flushing in Mill Cove.

Scope

5. Twenty proposed improvement plans were investigated during the course of this phase of the model study. These plans were subjected to brief testing, primarily visual observations and surface current pattern photographs. Following an analysis of photographs and visual observations, three plans were selected and subjected to extensive model tests to determine their effects on base condition hydraulics, salinities, flushing, and channel shoaling. This report contains the results of the above model tests.

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* H. B. Simmons, "Plans for the Improvement of the St. Johns River, Jacksonville to the Atlantic Ocean; Hydraulic Model Investigation," Technical Memorandum No. 2-244, Dec 1947, U. S. Army Engineer Waterways Experiment Station, CE, Vicksburg, Miss.

Prototype

6. A description of the prototype is presented in Report 1 and will not be included in this report.

The Model

7. The Mayport-Mill Cove model (Figure 2) was constructed at WES in 1975. The model reproduces approximately 287 square miles of the prototype area including a portion of the St. Johns River upstream to Hibernia Point (4 miles upstream from Doctors Lake); about 93 square miles of the Atlantic Ocean from about 5 miles south and north of the respective jetties and offshore areas well beyond the -60 ft contour; and the system of sloughs, creeks, and rivers that affect tidal action throughout the model area. A description of the model and appurtenances; details of model adjustment, model verification, and base tests; and limits of model accuracy are presented in Report 1 and are not included herein. The model was constructed to linear scales of 1:500 horizontally and 1:50 vertically, which resulted in the following model-to-prototype scales based on the Froudian relations: velocity 1:7.07, time 1:70.7107, discharge 1:176,777, volume 1:12,500,000, area (cross section) 1:25,000, area (horizontal) 1:250,000, and slope 10:1. The salinity and dye concentration ratios for the study were 1:1. One prototype cycle (semidiurnal) of 12 hr 25 min was reproduced in the model in 10 min 32.34 sec.

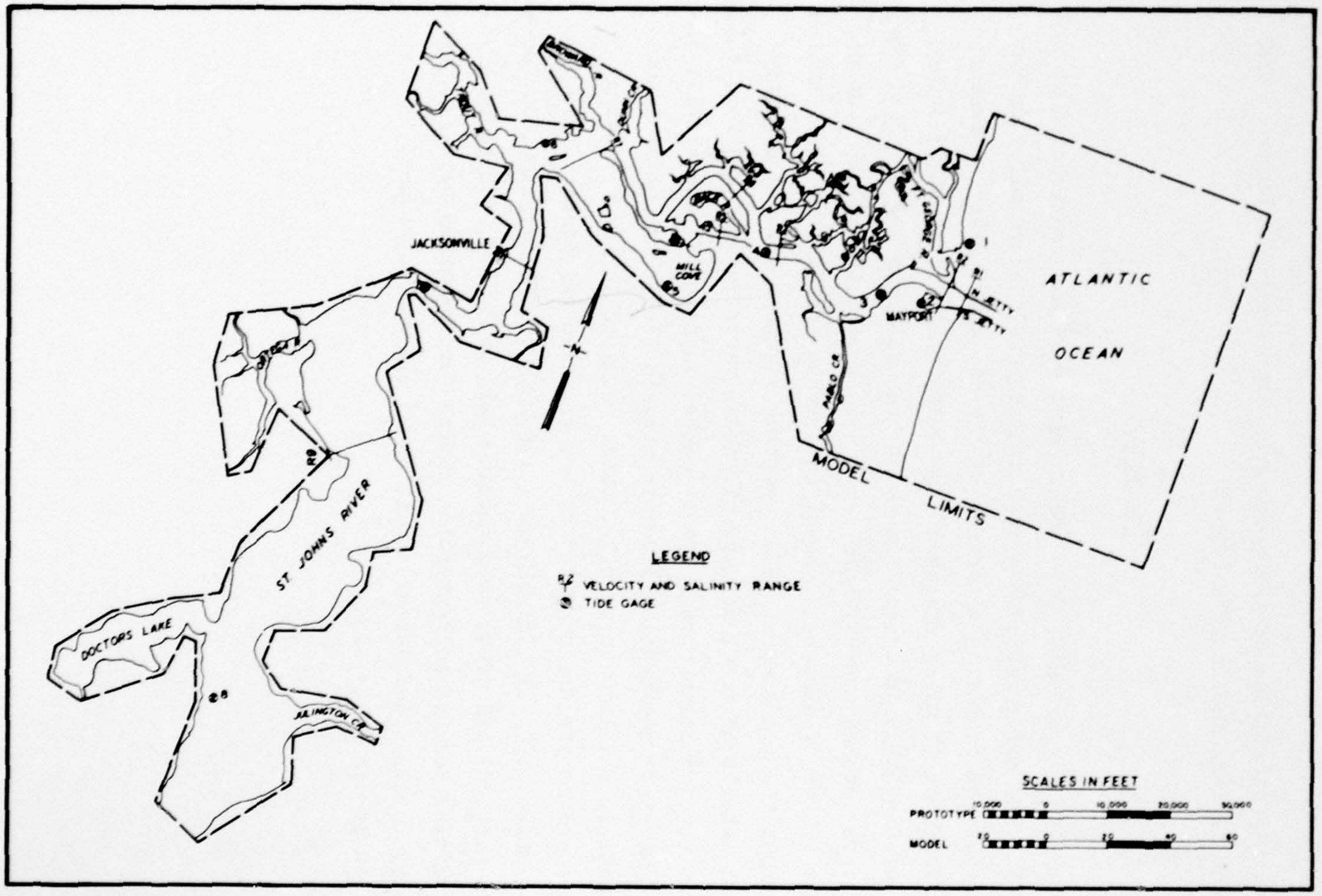

Figure 2. Model limits

PART II: TESTS AND RESULTS

Elements of Plans

8. During the course of the Mill Cove Study, 20 plans were investigated, from which 3 plans were selected for extensive model study. The following paragraphs contain a description of each plan investigated.

Plan 1

9. Plan 1 (Figure 3) consisted of a channel 1,000 ft wide by 9 ft deep at msl, dredged from the downstream end of Dame Point-Fulton Cutoff channel, opposite Back River entrance, to deep water (el -9 ft msl) in Mill Cove approximately 2,000 ft south of the existing weir in Mill Cove. The existing weir opening was closed during testing of this plan.

Plan 2

10. Plan 2 (Figure 3) incorporated all the elements of plan 1 in addition to a 1,500-ft-wide by 7-ft-deep (at msl) channel dredged through Quarantine Island. The second dredged channel through Quarantine Island was in alignment with the Dame Point-Fulton Cutoff channel. The existing weir was closed throughout testing.

Plan 3

11. Plan 3 (Figure 3) consisted of enlarging the existing Mill Cove weir to a minimum width of 500 ft. The opening depth and channel depth to the St. Johns River navigation channel were dredged to -12 ft msl. In each plan involving changes at the existing weir, the channel depth was uniformly dredged out to the point of intersection with the authorized channel.

Plan 4

12. Plan 4 (Figure 4) consisted of enlarging the existing weir to a minimum width of 1,000 ft. The depth remained at 12 ft msl.

Plan 5

13. Plan 5 (Figure 4) replaced the existing weir in Mill Cove with an opening having a minimum width of 1,300 ft and a depth of 12 ft msl.

Plan 6

14. The elements of plan 6 (Figure 4) consisted of enlarging the

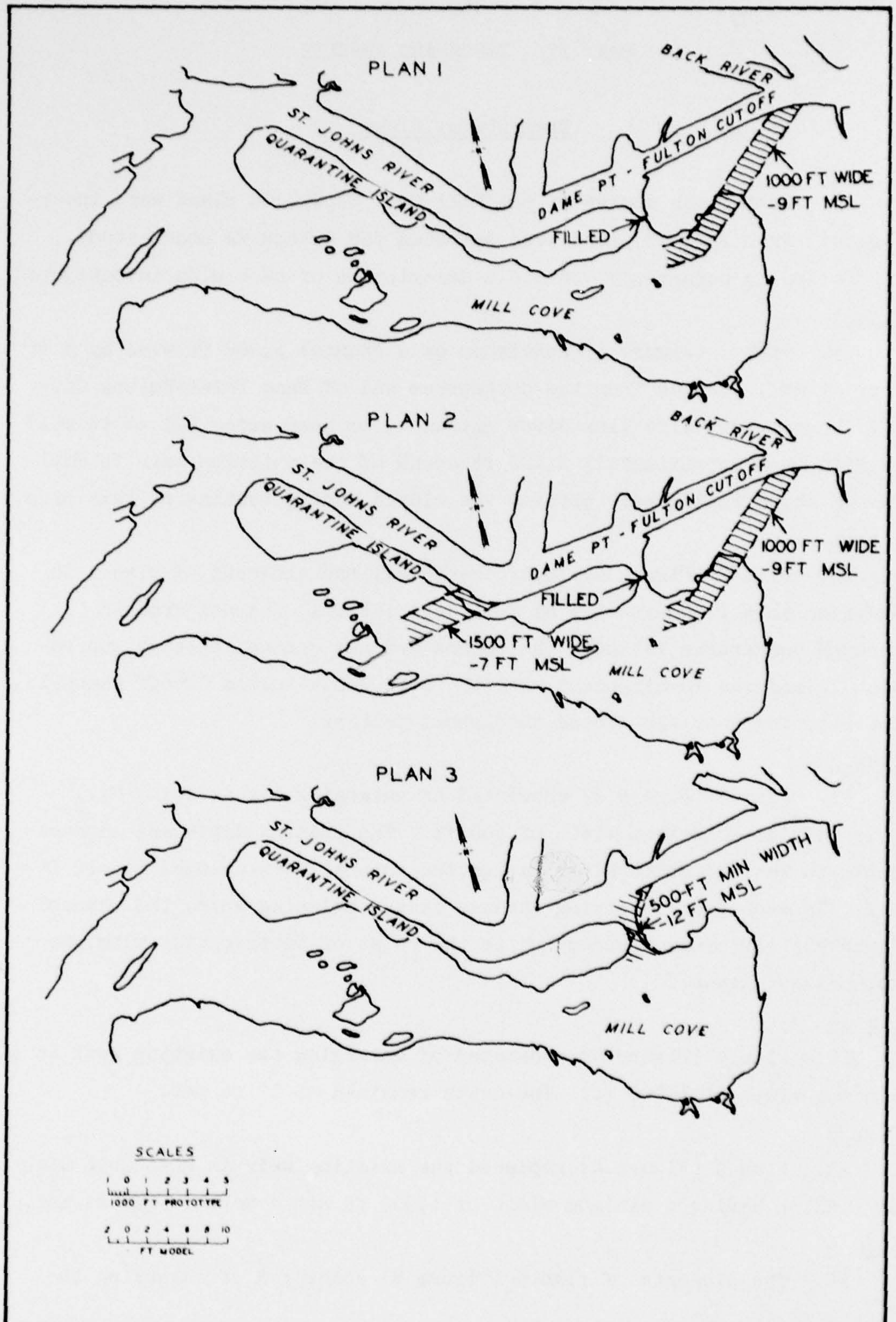

Figure 3. Elements of plans 1, 2, and 3

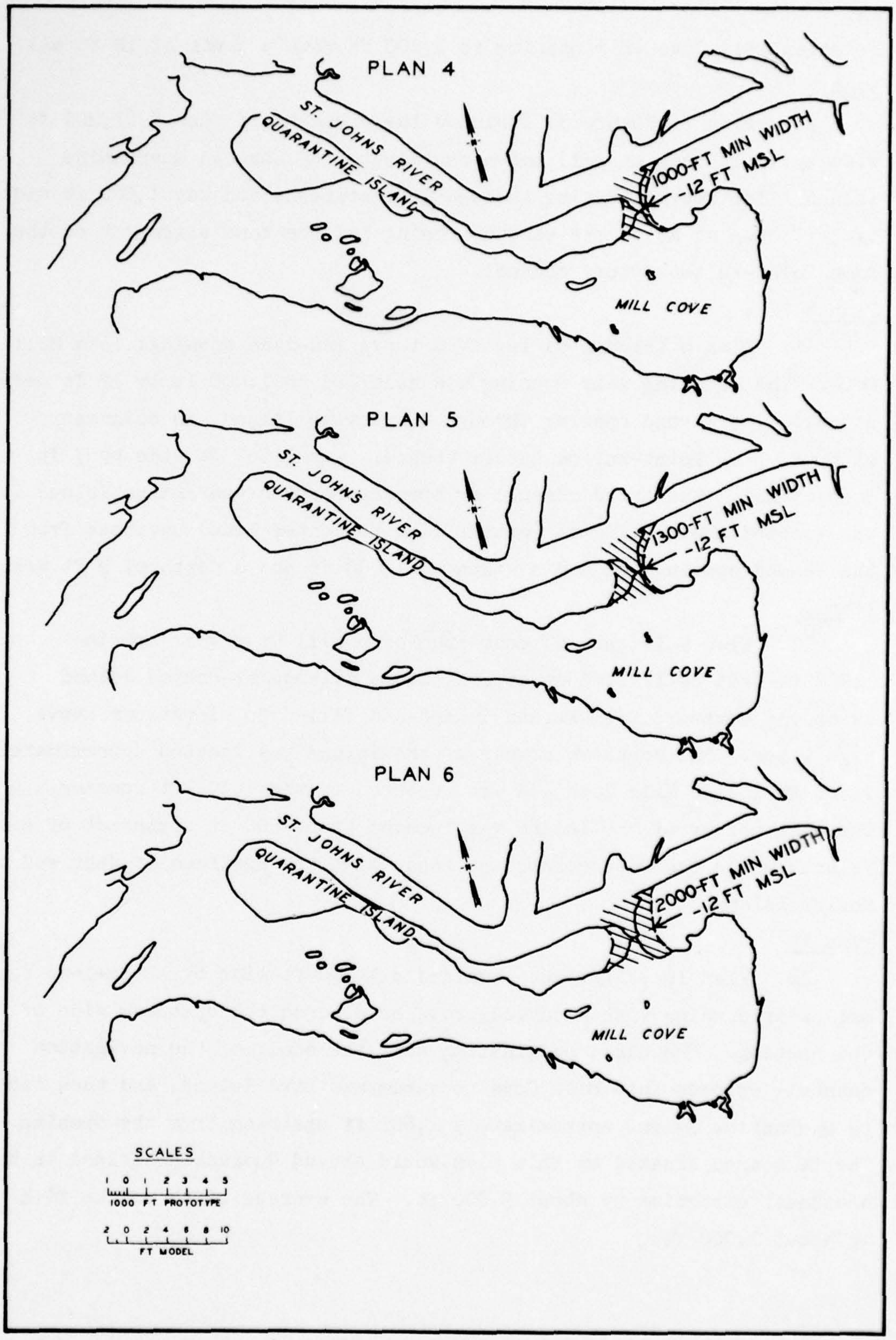

Figure 4. Elements of plans 4, 5, and 6

existing Mill Cove weir opening to 2,000 ft with a depth of 12 ft msl.

Plan 7

15. Plan 7 (Figure 5) included the elements of plan 5 (1,300 ft wide by 12 ft deep at msl) and a second opening through Quarantine Island. The second opening through Quarantine Island was 1,500 ft wide by 7 ft deep at msl. The second opening had the same alignment as the Dame Point-Fulton Cutoff channel.

Plan 8

16. Plan 8 (Figure 5) involved three man-made openings into Mill Cove. The existing weir opening was enlarged to 1,000 ft by 12 ft deep at msl. The second opening through Quarantine Island, in alignment with the Dame Point-Fulton Cutoff channel, was 1,500 ft wide by 7 ft deep at msl. The third channel or opening through Quarantine Island was located about 2,700 ft (center line to center line) upstream from the second opening and had a width of 1,000 ft and a depth of 9 ft msl.

Plan 9

17. Plan 9 (Figure 5) consisted of a Mill Cove weir opening 1,300 ft wide by 12 ft deep at msl, and a triangular-shaped island extending eastward from Marian Island and filled to elevations above high water. The northern corner of the island was located approximately 1,500 ft inside Mill Cove and was centered on the 1,300-ft opening. The east corner of the island was located about 500 ft southeast of Bird Island, while the west corner was located at the upstream or west end of Marian Island.

Plan 10

18. Plan 10 (Figure 6) combined a 1,300-ft-wide by 12-ft-deep (at msl) weir opening with a curved groin or dike on the upstream side of the opening. The dike, originating near the shelf of the navigation channel, extends into Mill Cove to encompass Bird Island, and then back to Quarantine Island approximately 1,800 ft upstream from the opening. The fill area created by this plan would extend Quarantine Island in the southeast direction by about 3,000 ft. The average width of the fill is about 1,000 ft.

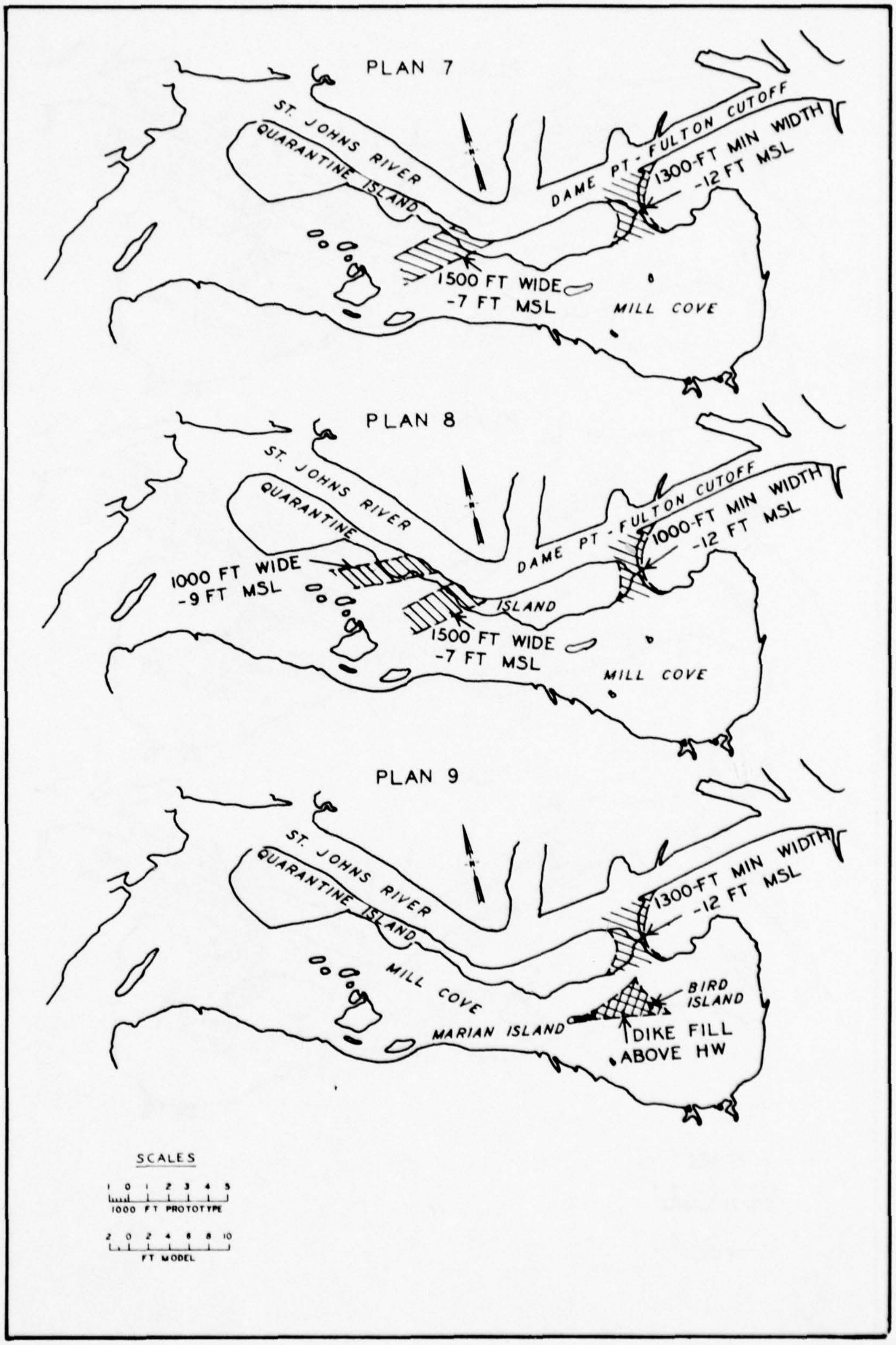

Figure 5. Elements of plans 7, 8, and 9

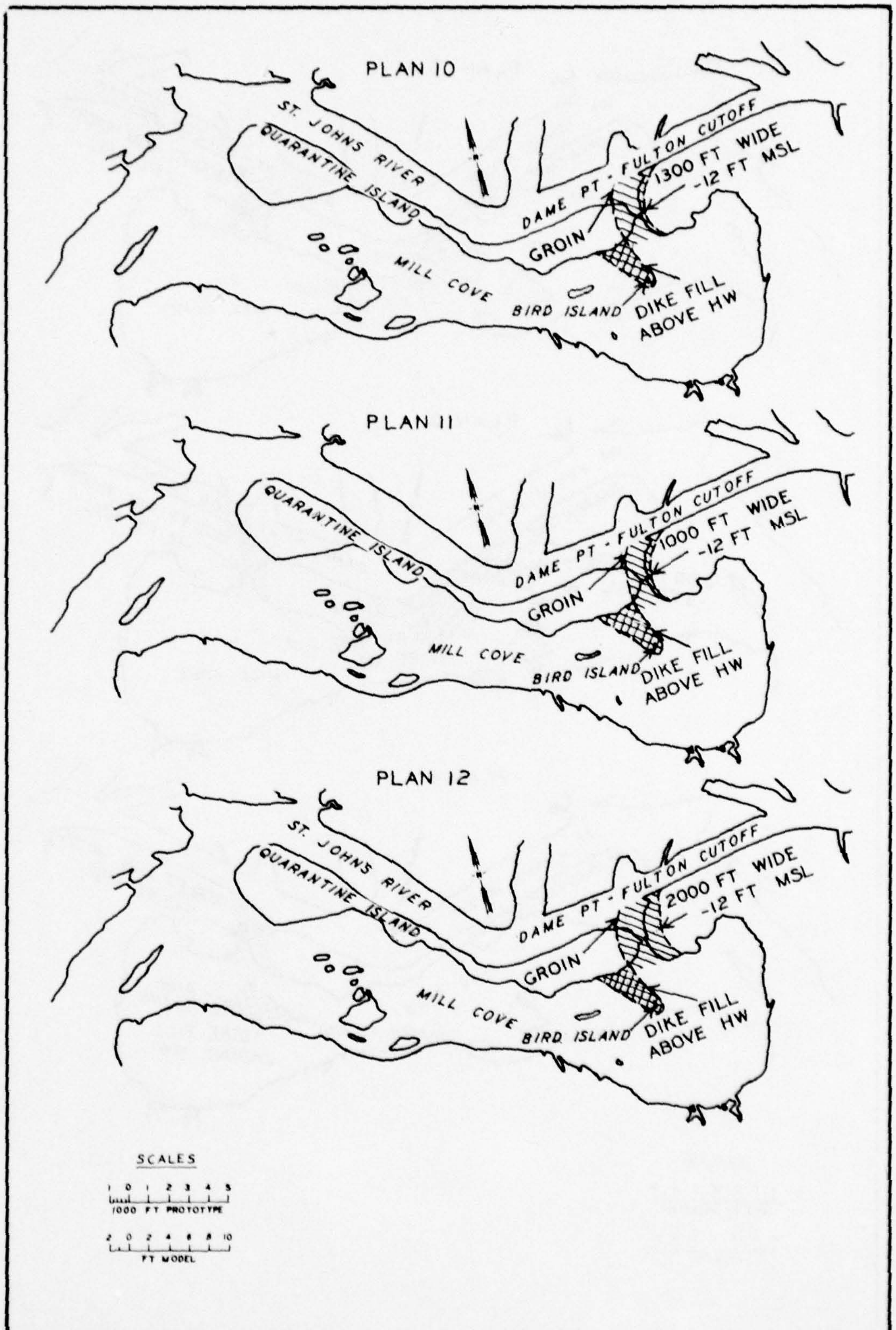

Figure 6. Elements of plans 10, 11, and 12

Plan 11

19. Plan 11 (Figure 6) was similar to plan 10, except that the weir opening was reduced to a minimum width of 1,000 ft. The depth remained at 12 ft msl. The fill area or extension to Quarantine Island would be slightly greater than that in plan 10.

Plan 12

20. Plan 12 (Figure 6) was likewise similar to plans 10 and 11 described above, except that in plan 12 the weir opening was increased to 2,000 ft. The 12-ft msl depth was retained.

Plan 13

21. Plan 13 (Figure 7) had a weir opening 1,300 ft wide (minimum) and a depth of 12 ft msl. Also involved in this plan was the closure of the upstream opening in Mill Cove between the upstream end (northwest) of Quarantine Island and the disposal island located off Reddie Point. The top elevation of the closure dike was above high-water elevation.

Plan 14

22. Plan 14 (Figure 7) weir opening was 1,300 ft wide by 12 ft deep at msl. The southwest opening of Mill Cove between Reddie Point and the disposal island located off Reddie Point was closed off to flow. The top elevation of the closure dike was above high-water elevation.

Plan 15

23. Plan 15 (Figure 7) included the elements of plan 9 (1,300 ft wide by 12 ft deep at msl with triangular-shaped island) and the relocation of approximately 1,400 ft of the west end of the disposal island located off Reddie Point to the east end of the disposal island. That portion of the island relocated was dredged to el -9 ft msl. The fill area on the east end was molded in at elevations above high water.

Plan 16

24. Plan 16 (Figure 8) included all of the elements of plan 15 in addition to a dike constructed to above high-water elevation along the south shore of Quarantine Island. The dike was constructed in an effort to streamline the flow through this area. The dike would provide minimum addition to Quarantine Island to achieve streamlining effects. The

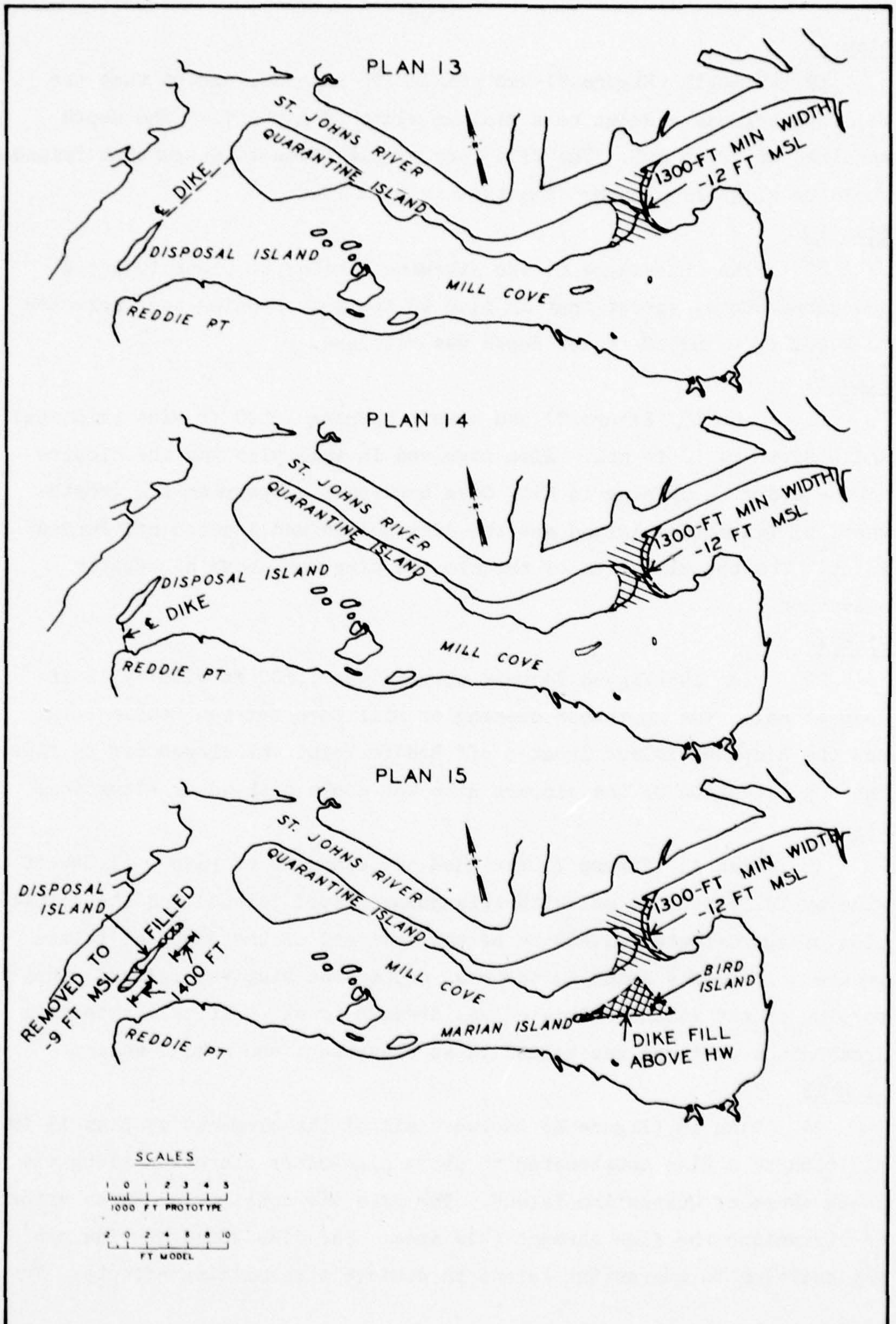

Figure 7. Elements of plans 13, 14, and 15

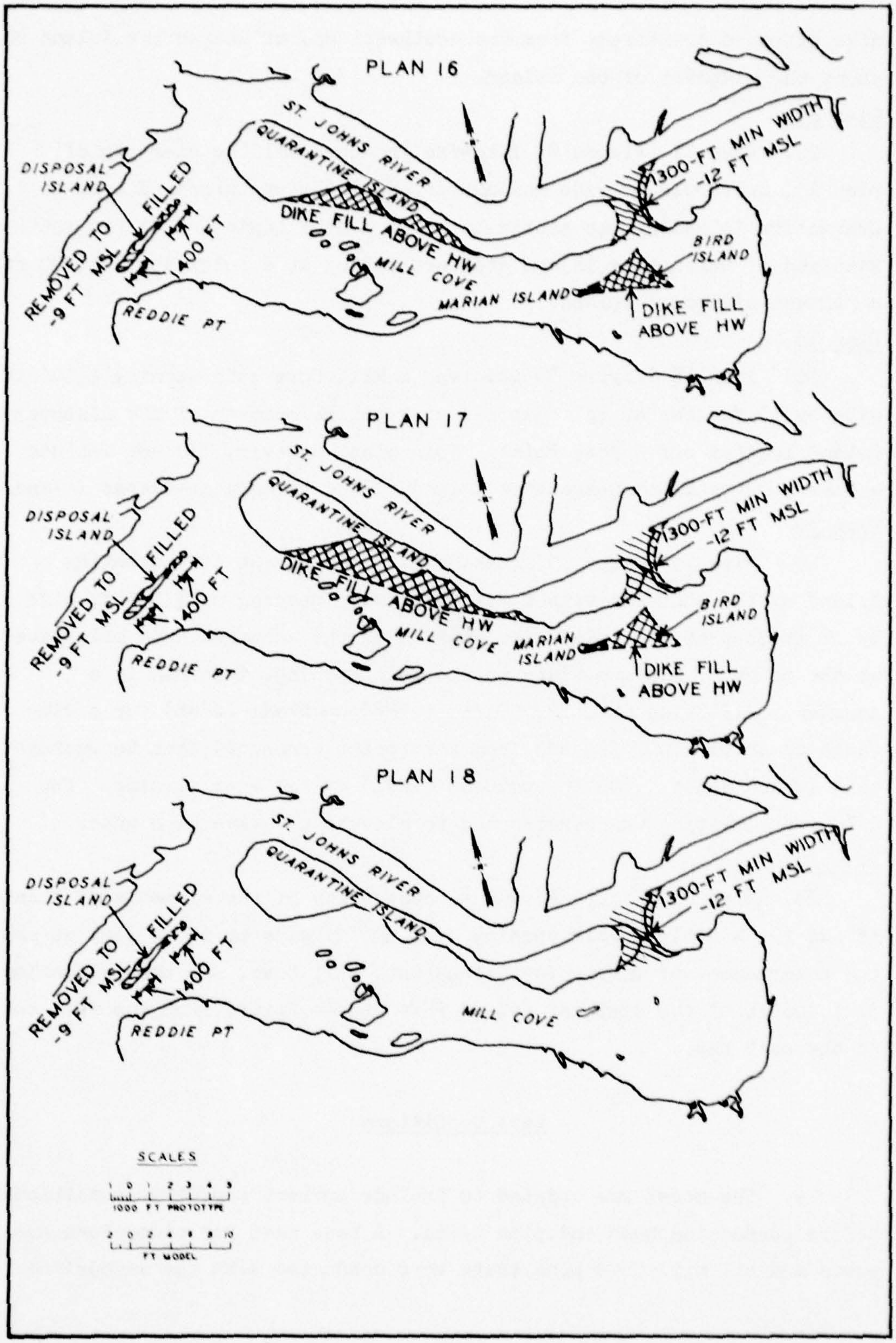

Figure 8. Elements of plans 16, 17, and 18

dike extended downstream from the southwest end of Quarantine Island to about the midpoint of the island.

Plan 17

25. Plan 17 (Figure 8) likewise included all the elements of plan 15, but would provide maximum streamlining or increased area to Quarantine Island by the construction of a dike beginning at the southwest end of Quarantine Island and terminating at a point about 1,500 ft northwest of Marian Island.

Plan 18

26. Plan 18 (Figure 8) involved a Mill Cove weir opening 1,300 ft wide by 12 ft deep at msl combined with the relocation of the disposal island located off Reddie Point. This plan, however, did not include a dike to streamline Quarantine Island or the triangular-shaped island.

Plan 19

27. Plan 19 (Figure 9) combined an enlargement of Quarantine Island on the east end with a Mill Cove weir opening of 1,300 ft wide by 12 ft deep at msl. The dike containing the enlarged area originated at the point of minimum width in the weir opening, then ran in a southerly direction about 2,000 ft, turned upstream (west) for a distance of about 1,000 ft, and from this point connected back to Quarantine Island about 1,600 ft upstream (west) of the weir opening. The dike top elevation was constructed to elevations above high water.

Plan 20

28. Plan 20 (Figure 9) was a combination of the elements of plans 18 and 19, a minimum weir opening of 1,300 ft wide by 12 ft deep at msl, the enlargement of Quarantine Island into Mill Cove, and the relocation of 1,400 ft of the disposal island (off Reddie Point) from the west end to the east end.

Test Conditions

29. The model was updated to include current prototype conditions before conducting base and plan tests. A base test for comparison purposes and all Mill Cove plan tests were conducted with the authorized

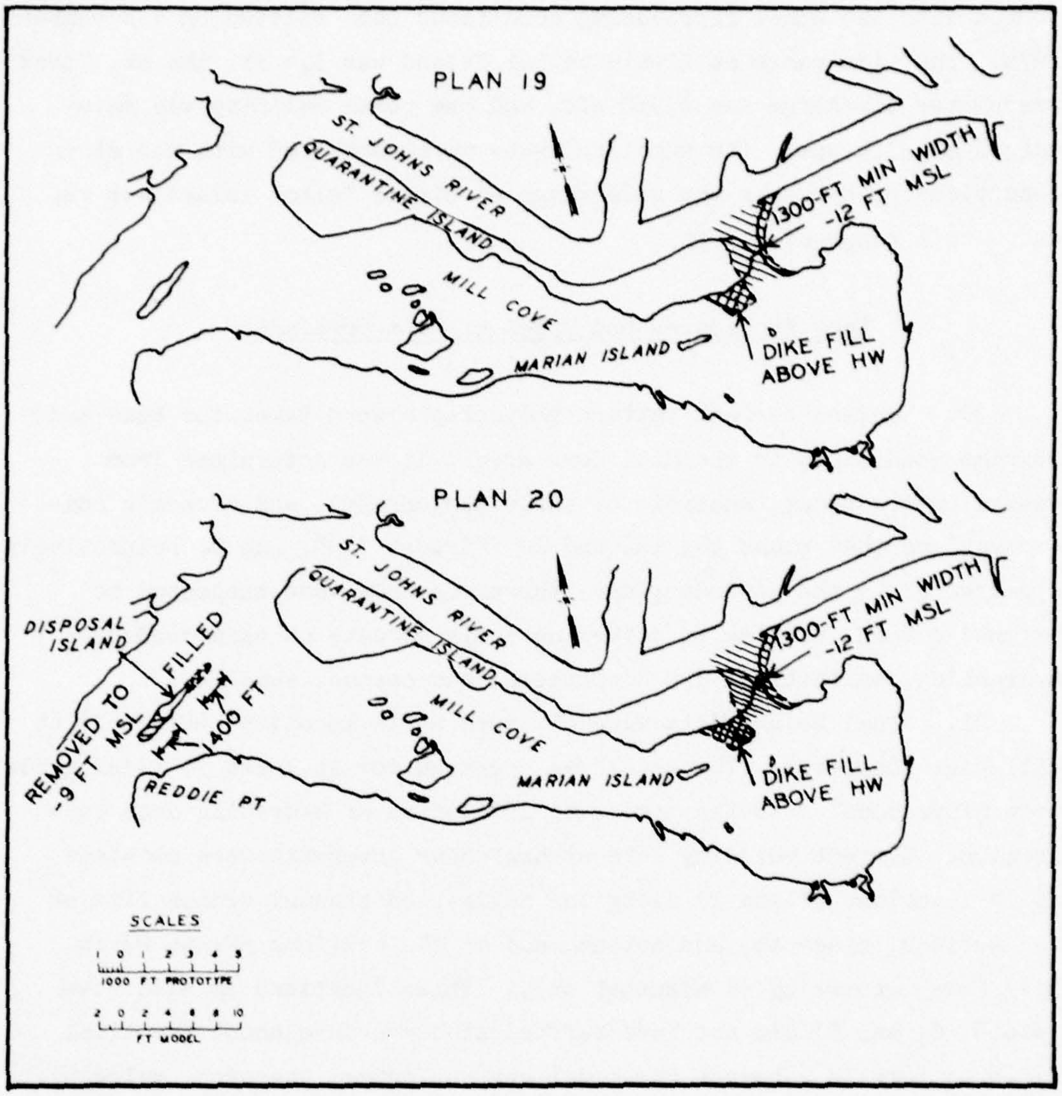

Figure 9. Elements of plans 19 and 20

38-ft navigation channel molded in the model and extended upstream to Jacksonville except for a short reach of the channel through the outer bar and entrance channel which had a depth of 42 ft msl. Hydraulic, salinity, dye, and surface current pattern photograph tests were conducted with the model reproducing conditions that existed on 7 November 1974. The tide range at Little Talbot Island was 5.4 ft, the St. Johns freshwater discharge was 8,950 cfs, and the ocean salinity was maintained at 33.0 ppt. The shoaling tests were conducted with the above conditions except that the tide range at Little Talbot Island was reduced to a range of 5.1 ft.

Test Procedures and Types of Data Obtained

30. Surface current pattern photographs were taken for base and 20 plan conditions in the Mill Cove area. It was determined from visual observations, analysis of these photographs, and economic considerations that plans 15, 18, and 20 (Figures 7, 8, and 9, respectively) appeared to be the optimum plans; therefore they were subjected to extensive model testing to determine their effects on base condition hydraulics, salinities, dye dispersion, and channel shoaling.

31. Tidal height data were obtained at 10 locations (Plate 1) at half-hour intervals. The model was operated for at least 10 tidal cycles to achieve model stability prior to initiation of hydraulic data collection. Current velocity data at half-hour intervals were obtained at 14 locations (Plate 1) along the navigation channel center line at the surface, middepth, and bottom, and at 14 locations (Plate 2) in Mill Cove, generally at middepth only. Three locations in Mill Cove (sta B, C, and D) did not have sufficient depth throughout the tidal cycle to totally submerge the model current meter; therefore velocity measurements at these three locations were made with surface floats. The float data at the above three locations were obtained in the same manner as float data or current velocities observed in the Mayport Naval Basin study (Report 2). Surface and bottom data were obtained at the east entrance weir to Mill Cove.

32. The test procedure followed while obtaining photographs for use in constructing surface current pattern mosaics was identical with that discussed in Report 1. The photographs are time-lapse exposures of confetti (small 1/2- × 1/2- × 1/8-in. pieces of Styrofoam) floating on the water surface obtained at hourly intervals. A strobe (bright flash) light was flashed just prior to the closing of the camera lens, resulting in a bright spot at approximately the end of each confetti streak, thus indicating the direction of flow. Current velocity measurements can be determined by measuring the total length of the streak and comparing the length with the velocity scale provided in the photographs.

33. Salinity data were obtained at 17 locations (Plate 1) along the center line of the navigation channel at the surface, middepth, and bottom, and at 14 locations (Plate 2) at the middepth in Mill Cove. Water samples were collected each prototype hour over a complete tidal cycle. The model was operated for at least 20 tidal cycles to achieve salinity stability prior to the initiation of salinity data collection.

34. Mill Cove dye dispersion tests involved two different dyes released at two separate points (Plate 1) in the model. One release was made at sta J in Mill Cove, and the second release was made at the center line of the navigation channel directly under the Mathews Bridge. The dye in Mill Cove was released at the bottom at a prototype rate of 10 mgd and had an initial concentration of 500,000 ppb. The dye at Mathews Bridge was released at the surface (about 2 ft below low-water elevation) at a prototype rate of 20 mgd and also had an initial concentration of 500,000 ppb. The density of both dyes approximated that of fresh water. Prior to injection, known weights of dye were mixed very carefully with accurately measured volumes of water and stored in glass tanks. The dye mixture was introduced into the model through a small copper tube connecting the tank to the injection location and depth, etc. Located in the copper line was a small calibrated laboratory pump to ensure a uniform injection rate throughout the test period.

35. The model was operated for 20 tidal cycles to allow the model to reach salinity stability prior to initiation of dye dispersion tests.

Cycle 1 began at the conclusion of the 20th stability cycle. Dye release began at both release points at hour 0 of the first tidal cycle and was continued at the constant rates discussed above for the following 16 tidal cycles. Water samples containing the dye were collected at the occurrence of local high- and low-water-slack periods during the tidal cycle throughout the 16-cycle test period. Because the plans change the times of slack water, the data are not necessarily for the same hour of the tidal cycle for base and plan results. Dye samples were obtained at 18 locations (Plate 1) along the navigation channel center line including the ocean at the surface and bottom. Samples were collected at 13 locations (Plate 2) in Mill Cove at the middepth only. Samples were not collected at sta MCJ. Samples were also collected from the model sump throughout the test period.

36. Tests to determine the effects of Mill Cove improvement plans 15, 18, and 20 (Figures 7, 8, and 9, respectively) on shoaling were conducted only for the authorized navigation channel. Shoaling test results with the Mill Cove improvement plans installed were obtained for channel shoaling sections 27-117, corresponding to base condition reaches B-G and for shoaling sections 1-26 in reach H (Plates 3-6). The shoaling material used, injection times, location, and model procedures are identical with those developed during the channel shoaling verification and are discussed in detail in Report 1. All shoaling tests reported herein were conducted identically with the procedures described in Report 1. Depths within Mill Cove do not permit conventional shoaling tests.

Test Results

Tidal heights

37. The effects of plans 15, 18, and 20 on tidal heights at 10 locations throughout the estuary are shown in Plates 7-10. The data, collected at half-hour intervals, were plotted and smooth curves were drawn through the points. Locations of the tide stations are shown in Plate 1.

Current velocities

38. The effects of plans 15, 18, and 20 on current velocities at 28 locations throughout the estuary are shown in Plates 11-30. Current velocity data were obtained at half-hour intervals at the surface, middepth, and bottom in the navigation channel, where depth permitted, and at only one depth in Mill Cove. The water depth in Mill Cove was too shallow to obtain more than a single reading; however, two depths were obtained at the weir located at the east entrance (sta MCA). The resulting data were plotted and smooth curves were drawn through the points. Locations of current velocity stations in Mill Cove are shown in Plate 2.

39. Current velocity data for the base and all plan tests were analyzed to determine flow predominance. This method of presenting current velocity data reduces magnitude, direction, and duration of the currents to a single expression that defines the predominant direction and percentage of total flow at any given point. This expression was derived from a conventional plot of velocity versus time at any given point. The area subtended by both ebb and flood portions of the curve was measured and summarized. The area subtended by the flood portion of the curve was then divided by the total area to determine what percentage of the total flow was in the flood direction. A negative (-) sign and a positive (+) sign were designated to indicate ebb direction and flood direction, respectively. For simplification, the percent of flow in the flood direction was calculated, then a value of 50 percent was subtracted from the calculation to determine predominant direction and magnitude. Using this method of analysis, a value of 0 percent indicates that flows in both the ebb and flood direction are equally balanced; i.e., the ebb and flood portions of the curve are equal. A value of +50 percent indicates that flow at that point is in the flood direction at all times during a tidal cycle, while a -50 percent value indicates flow in the ebb direction throughout a tidal cycle. The tables and plates in this report use the above method to show flow predominance.

40. Table 1 contains flow predominance data for the navigation

channel and Mill Cove stations. Table 2 shows the maximum ebb and flood currents in Mill Cove for plans 15, 18, and 20.

Surface current patterns

41. Surface current pattern mosaics were constructed for base conditions and for each of the 20 plans investigated. The area covered by the mosaics includes all of Mill Cove, the portion of the authorized navigation channel parallel to the cove, and a small portion of the navigation channel upstream and downstream from the west and east entrances to the cove, respectively. Photographs were made each hour throughout a complete tidal cycle for the base and each plan condition. Base condition mosaics for each hour are presented in Photos 1-7. In order to conserve space, only maximum ebb and maximum flood conditions are presented for the plans not selected for detailed study (Photos 8-24). Plan condition mosaics showing surface current patterns at the remaining hours during the tidal cycle are on file at Jacksonville District Office and at WES. Mosaics for each hour for plans investigated in detail are presented in Photos 25-45.

42. These mosaics were used in evaluating the proposed plans in respect to current patterns, circulation patterns, and effects on navigation in the navigation channel and Mill Cove. The mosaics also provide a means for current velocity measurements in areas too shallow for measurements with the model velocity meter. Surface current pattern photographs were made with the model reproducing a 5.4-ft tide (Little Talbot Island), a freshwater inflow of 8,940 cfs, and a source salinity of 33.0 ppt. The mosaics were prepared from time-exposure photographs (paragraph 32).

Salinities

43. The effects of plans 15, 18, and 20 on hourly salinity values at 31 locations are shown in Plates 31-53, and in Table 3 (average salinities). Locations of stations monitored for base and plan conditions are shown in Plates 1 and 2. Salinity samples were collected at the surface, middepth, and bottom at stations located in the navigation channel and at the middepth at the stations located in Mill Cove, except that surface and bottom samples were obtained at sta MCA. Salinity

samples were collected hourly throughout a complete tidal cycle; following determination of salinity concentrations by using a salinity meter, the data points were plotted and smooth curves drawn through the points.

Dye dispersion

44. The effects of plans 15, 18, and 20 on high- and low-water-slack dye concentrations throughout the model are presented in Plates 54-257. Locations of dye injection and sampling stations are shown in Plate 1. Two different dyes were used in the Mill Cove study. One dye (Pontacyl Brilliant Pink) was released at sta MCJ in Mill Cove at a rate of 10 mgd and had an initial concentration of 500,000 ppb. The second dye (Uranine) was released at Mathews Bridge at a rate of 20 mgd and had an initial concentration of 500,000 ppb.

45. Individual dye release and plan results are shown separately. Results from the Mill Cove release with plans 15, 18, and 20 installed are shown in Plates 54-87, 88-121, and 122-155, respectively. Results from the Mathews Bridge release for plans 15, 18, and 20 are shown in Plates 156-189, 190-223, and 224-257, respectively. Tables 4 and 5 show above data in tabular form for the Mill Cove and Mathews Bridge releases, respectively. Table 6 shows average dye concentrations (averaged over 16-cycle test periods) for the above tests.

Shoaling tests

46. Shoaling tests were conducted with plans 15, 18, and 20 to determine their effects on shoaling rates and patterns in the navigation channel. Shoaling tests were conducted for reaches B-H. Locations of these channel shoaling reaches are shown in Plates 3-6. Shoaling index values resulting from plan tests are presented in Table 7.

47. Channel shoaling tests were conducted identically to verification and base tests described in Report 1; the only variable was the installation of the proposed plan under investigation. A minimum of two identical runs was made with each plan installed in the model. Following the tests, the results were averaged and compared with the base test results to determine the effects resulting from the construction of the plan.

PART III: DISCUSSION OF RESULTS

Tidal Observations

48. The effects of plans 15, 18, and 20 on tidal heights and tide phase are shown in Plates 7-10. These effects were generally small and insignificant throughout the model, as indicated in the following tabulation at high- and low-water elevations at each of the 10 locations monitored during model testing.

Elevation, ft msl

Station No.	Base High	Base Low	Plan 15 High	Plan 15 Low	Plan 18 High	Plan 18 Low	Plan 20 High	Plan 20 Low
1	3.4	-1.9	3.4	-1.9	3.4	-1.9	3.4	-1.9
1A	3.4	-1.9	3.4	-1.9	3.4	-1.9	3.4	-1.9
3	3.2	-1.6	3.2	-1.5	3.2	-1.6	3.1	-1.6
4	3.2	-1.0	3.1	-1.0	3.1	-1.0	3.1	-0.9
5	2.9	-0.5	2.9	-0.5	3.0	-0.6	2.9	-0.6
6	2.8	-0.2	2.6	-0.3	2.6	-0.3	2.6	-0.3
7	2.1	0.2	2.1	0.1	2.1	0.3	2.1	0.1
8	1.9	0.8	2.0	0.9	2.0	0.9	2.0	0.8
9	2.9	-0.9	2.9	-0.9	2.9	-0.8	2.9	-0.9
10	2.9	-0.6	2.9	-0.8	2.9	-0.7	2.9	-0.8

49. Minimal effects were observed at high- and low-water elevations. The greatest change to high-water elevation was observed at sta 6, where the elevation was lowered about 0.2 ft with each of the three plans installed. Low-water elevations at this gage were likewise lower than base elevations by about 0.1 ft with each plan installed. Low-water elevation at gage 10 was lowered 0.2 ft, 0.1 ft, and 0.2 ft with plans 15, 18, and 20, respectively, while high-water elevations at this location were unchanged.

50. Also, Plates 7-10 show that there was no change in tide phasing as a result of these three plans. Although the actual times of occurrence of high- and low-water elevations were relatively unchanged, the filling and emptying rates in Mill Cove (sta 5 and 10; Plates 8 and 10, respectively) were significantly changed. That is, the slopes of the inflection point of the tidal curves were steeper for the plans

than for the base conditions; thus with the larger openings installed (common with each of the three plans), the cove filled and emptied at a faster rate than was experienced during base conditions. Other than the above effects, very little change was noted to the tidal observations.

Currents

51. The effects of plans 15, 18, and 20 on hourly current velocities are shown in Plates 11-30. Effects of the above plans on flow predominance are shown in Table 1 and in Figures 10-13. Effects of the plans on maximum ebb and flood currents in Mill Cove are shown in Table 2 and Figure 14.

52. Surface current pattern mosaics were made hourly over a complete tidal cycle for the base and each of the initial 20 proposed plans. Hourly photographs showing base condition surface current patterns are presented in Photos 1-7. Only hours 2 and 9, maximum ebb and flood current, respectively, corresponding to maximum ebb and flood periods observed in the navigation channel paralleling Mill Cove are presented in this report for the plans not selected for detailed testing. Photos 8-24 show the effects of plans 1-14, 16, 17, and 19 on surface current patterns occurring at the periods of maximum currents in Mill Cove and adjacent navigation channel. Photos 25-45 are surface current patterns for plans 15, 18, and 20.

53. Each of the 20 plans photographed showed varying degrees of improvement about increasing current velocities through the cove. Plans 15, 18, and 20 were selected by the Jacksonville District for extensive study following an analysis of the above mosaics, visual observations of each plan in operation in the model, and economics of each plan.

54. The areas of the main navigation channel where current velocities were changed by the plans 15, 18, and 20 were in the areas of each of the entrances to Mill Cove. Since each of the plans involved a considerable increase in the size of the eastern opening to Mill Cove, a significant increase in total discharge into Mill Cove occurred for each

plan. Immediately downstream from the entrance at mile 9 (Plate 15), the flood velocities were significantly decreased near the bottom. During the strength of flood each of the plans resulted in a decrease of approximately 1.0 fps. At middepth, plan 18 caused a reduction of approximately 1.5 fps to flood velocities during strength of flood. No change in phasing was apparent for mile 9.

55. In the main navigation channel (mile 10) near the east entrance to Mill Cove, slack water after ebb occurred at approximately hour 6 for the base condition on the surface (Plate 16). In the east entrance to Mill Cove (sta MCA), slack water after ebb occurred before hour 4 (Plate 25). With the plans installed, slack after ebb in the east entrance occurred at hour 4 or slightly later than that for base tests. Because of the much larger volumes of water being transported into and out of Mill Cove for plan tests, phasing changes occurred in the navigation channel near the entrance. Upstream from the entrance (sta 10.5, Plate 17) surface slack after ebb was delayed for each plan from hour 6 to hour 7.5. During this period of time, flow entered Mill Cove for the plans from both the upstream and downstream directions. Low-velocity crosscurrents existed in the navigation channel during this period. Between the hours of 4 and 8 the flow distribution in the east entrance shifted from a concentration of high-velocity flow along the eastern portion to a high concentration of flow along the western portion. The shift in the location of the flow occurred rapidly between hours 7 and 8. By hour 8 the flow into Mill Cove was coming entirely from the downstream direction with inflow into Mill Cove concentrated in the western portion of the entrance. Low-velocity ebb or flow out of Mill Cove existed in the eastern portion. At hour 9 the velocities in the main channel were near the maximum flood velocity, and the crosscurrents for the plans that occurred earlier were essentially nonexistent. The flood flow into Mill Cove was sustained along the western portion of the east entrance to Mill Cove, with ebb flow in the eastern portion. Immediately upstream of the entrance (Plate 17), changes occurred in the surface velocities due to the plans. Because of the influence of the widened eastern entrance to Mill Cove, velocities

were drawn in the direction of Quarantine Island with an associated decrease in magnitude of the velocity along the center line of the main channel. Inspection of the velocity time history in the east entrance to Mill Cove, (Plate 25) shows that the velocity magnitude for the base condition dipped between hour 7 and 8. This dip was caused by the difference in phasing of 2 to 3 hr between flow in the main portion of Mill Cove and the navigation channel along Quarantine Island. The plans caused a major change in phasing of the flow within Mill Cove to result in closer agreement with the main channel; therefore the dip in velocity did not occur for the plan results.

56. Flow into Mill Cove along the northern portion and out of Mill Cove along the southern portion of the entrance continued until hour 11. By hour 11 slack after flood occurred for both base and plan tests with flow occurring out of Mill Cove across the entrance. By hour 12 crosscurrents of approximately 1.5 fps occurred in the navigation channel at the entrance for the plans. Immediately upstream from the entrance (Plate 17), velocities in the main channel were reduced by the plans. This occurred because the flow to the downstream area was supplied in a greater amount by Mill Cove for each plan. Flow reductions for the plans occurred above the eastern entrance to Mill Cove until hour 2. The crosscurrents also continued to exist for the plans in a decreasingly significant degree until hour 2. By hour 2, the maximum ebb velocities were attained and the influence of the flow from Mill Cove was confined to along the Mill Cove side of the main channel below the entrance to Mill Cove. This condition continued to exist for hour 3.

57. The influence of changes at the eastern entrance to Mill Cove on the navigation channel was reflected in the main navigation channel along Quarantine Island (Plates 18 and 19). A slight change in the phasing during flood occurred at the surface throughout the navigation channel downstream of the western entrance to Mill Cove. Changes in the area of the western entrance to Mill Cove and above were less evident.

58. Figures 10, 11, and 12 show flow predominance calculations for the surface, middepth, and bottom, respectively, at navigation channel center-line stations. Inspection of these data shows that flow

predominance in the navigation channel generally was not significantly affected at any depth. Flow predominance at the surface was slightly increased in the flood direction downstream from the weir opening and increased in the ebb direction upstream to the western entrance to the cove (Figure 10). Maximum effects at the surface occurred upstream from the weir opening (sta 10.5, 12A, and 14A). Ebb flow predominance was strengthened considerably by each of the three plans investigated. At no point along the channel center line were surface flow predominance values (all ebb) changed from ebb to flood as a result of either plan.

59. Flow predominance values at the middepth at channel centerline stations (Figure 11) showed very small changes from base conditions. Upstream from the weir opening, unlike the surface, flow predominance was generally toward a stronger flood or weaker ebb direction, while downstream the trend was, again opposite from the surface, toward a stronger ebb or weaker flood direction. With plan 15 installed, the predominant flow direction at the middepth was reversed at sta 5A, 7B, 9B, and 10.5. With plan 18 installed, the predominant flow direction was altered at only two stations, 7B and 10.5. No directional changes were noted with plan 20 installed.

60. Bottom flow predominance (Figure 12) were very similar for each plan. Stations downstream from sta 10.5 (mile 10.5) were changed generally toward a weaker flood predominance, while upstream from this point (mile 12 to mile 24) flow predominance was generally changed to weaker ebb, from essentially balanced to flood or to stronger flood direction. Changes in direction of predominant flow were noted at two locations, sta 9B and 12A, at the bottom with plan 15 installed. Only at one point (sta 12A) was the direction altered with plan 18 installed in the model. Directional changes in flow predominance were noted at two locations (sta 9B, and 12A) with plan 20 installed. Again, effects of the three plans were very similar. In each plan condition, bottom flow predominance values in the vicinity of miles 9, 13, 15, 20, and 22 were very close to balanced flow, which indicates the potential for shoaling at these locations. As will be discussed in a later section

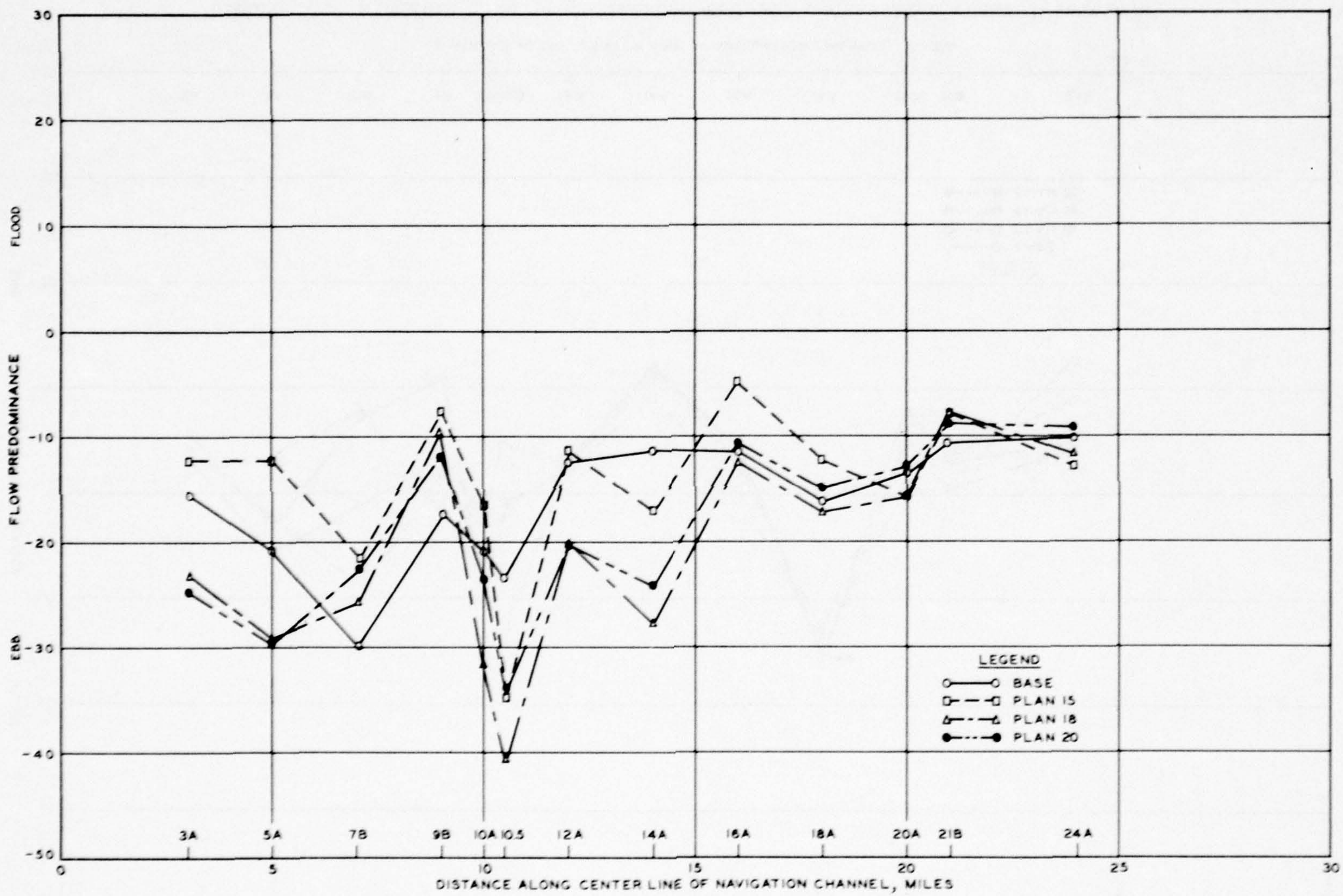

Figure 10. Surface depth flow predominance profile, center-line channel stations

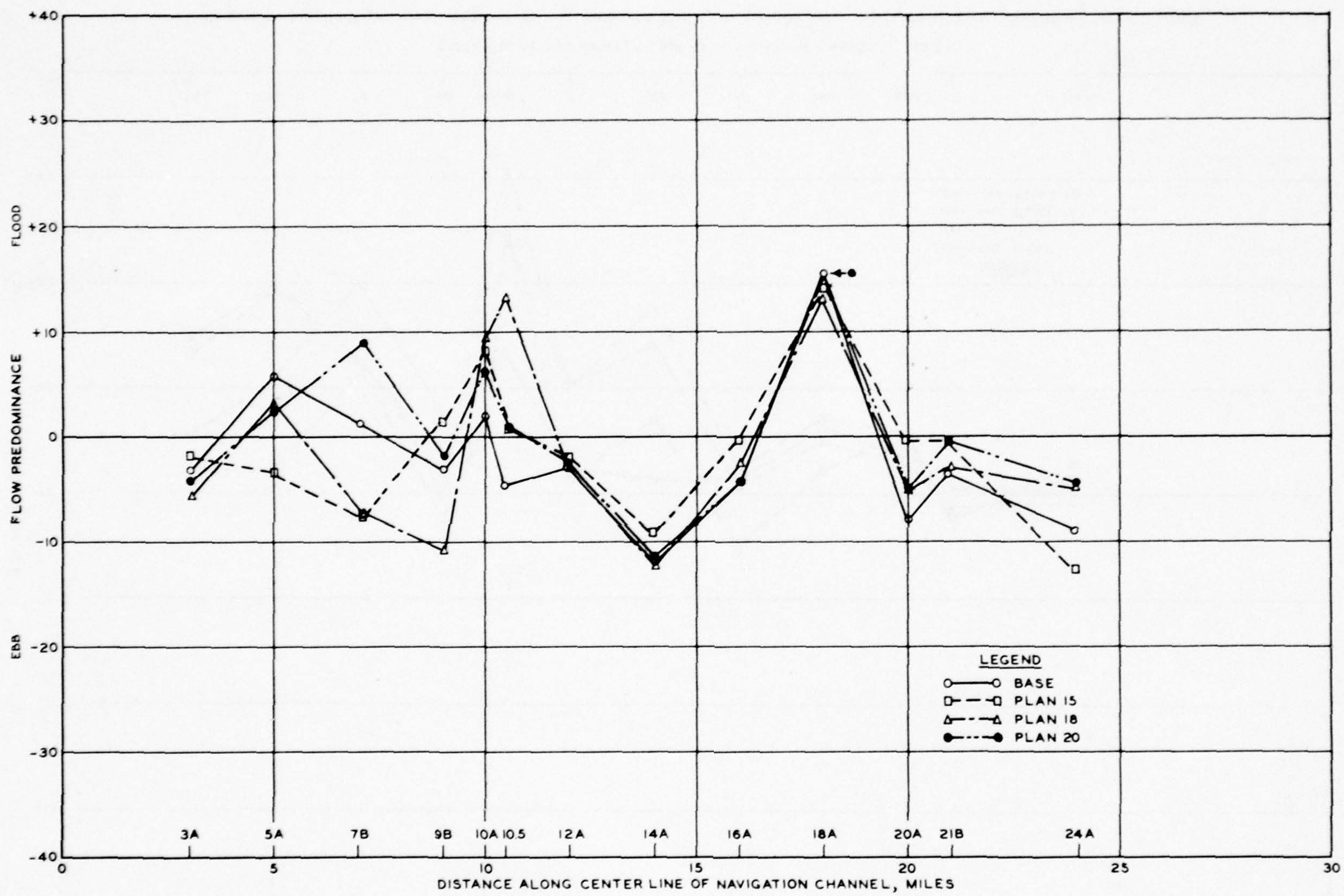

Figure 11. Middepth flow predominance profile, center-line channel stations

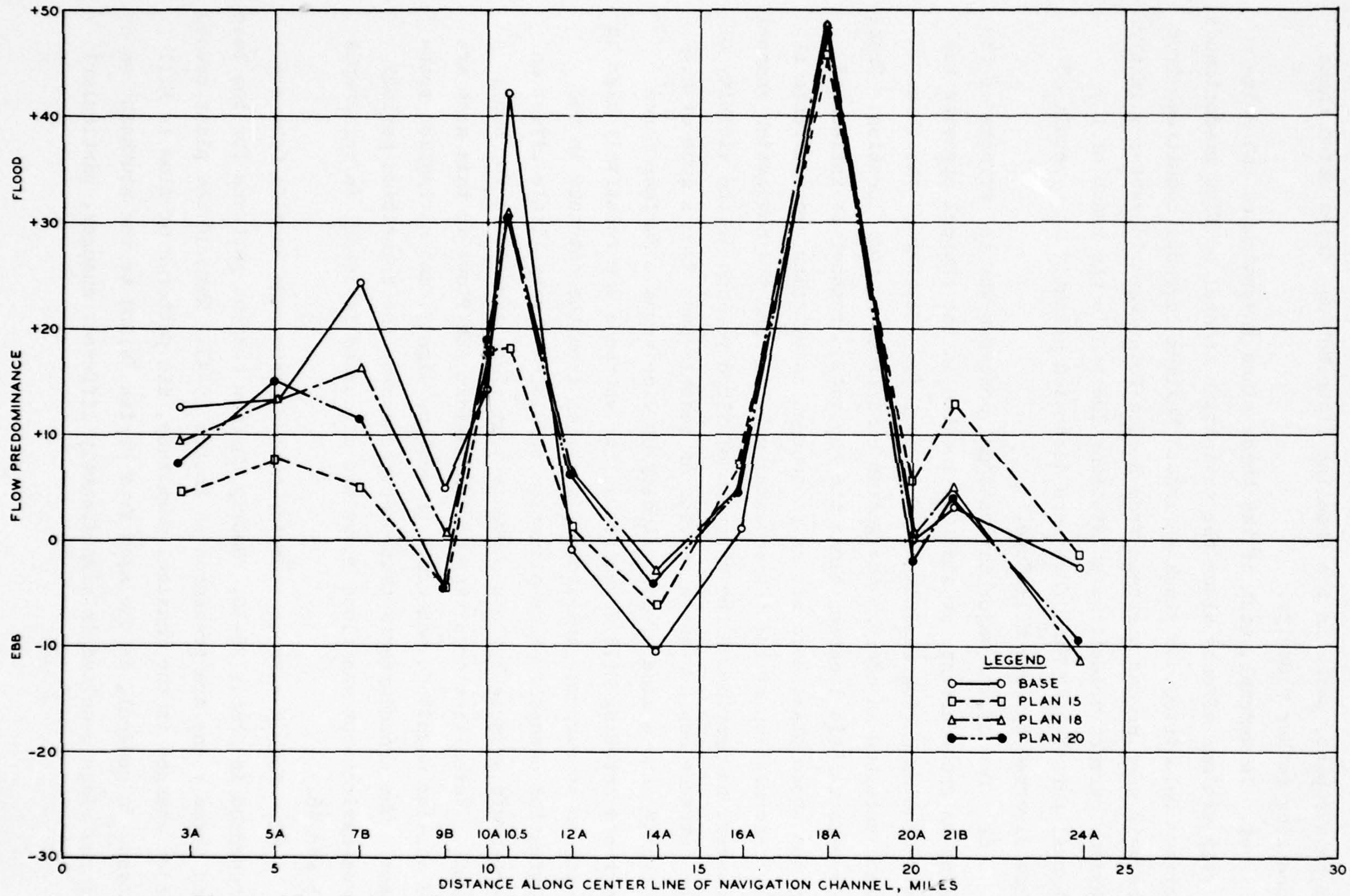

Figure 12. Bottom depth flow predominance profile, center-line channel stations

of this report, peaks in the shoaling distribution curves match these locations rather closely.

61. In general, each of the three plans investigated had relatively minimal effects along the navigation channel on flow predominance, maximum velocities, or slack periods. Maximum currents downstream from the weir opening and upstream from Reddie Point were increased slightly. Maximum current velocities at stations located in the reach of the channel paralleling Mill Cove were decreased slightly as a result of flow diverted through Mill Cove.

62. One of the major navigational concerns was the effects of the plans on crosscurrents at sta 10A, located in the channel opposite the weir opening during maximum ebb flow periods. Neither of the three plans resulted in adverse navigation conditions at this location. Crosscurrents at this location along the navigation channel as influenced by the above plans were not as pronounced as existing crosscurrents at the intersection of the intracoastal waterway and the navigation channel. However, navigating at the strength of flood periods in the vicinity of the entrance could require caution as vessels pass from a zone of high velocity into a zone of low velocity or vice versa. Surface flood currents entering Mill Cove through the entrance are relatively high in relation to currents immediately upstream from the entrance in the navigation channel. This situation should have very little effect on deep-draft vessels but could create some minor turbulence for small craft. Velocities occurring during maximum ebb flows in this area are of similar magnitude and would present no significant navigation problems. The crosscurrents that occurred during the transition periods from maximum ebb and flood flows are discussed in detail in paragraphs 55 and 56.

63. Hourly current velocity measurements made in Mill Cove are presented in Plates 25-30. Hourly surface current patterns for the base and three plans are presented in Photos 25-45. Each of the plans caused major changes in the phasing, magnitude, and patterns of flow in Mill Cove. In general, in the area from Marian Island to the southeast each of the plans resulted in significantly different changes, particularly

to flow patterns. In terms of improving flushing in the southeastern end, inspection of the surface current pattern shows that plan 15 caused the most significant improvement.

64. In the remaining portions of Mill Cove, the plans caused reasonable similar changes. At the east entrance to Mill Cove, the plans advanced the time of high-water surface slack from greater than 1.5 hr for plan 18 to more than 0.5 hr for plan 20. The time of low-water surface slack was delayed by about 0.5 hr by each plan. These phase changes caused the flow to be more out of phase with flow in the main channel at strength of flood and slack after flood on the surface and were major contributors to the changes in the flow in the navigation channel discussed in paragraphs 54-57 and 62. The plans caused major changes to the time of high-water slack in the western portion of the cove. These changes brought high-water slack in this area nearly into phase with flow in the main channel. Inspection of the surface current patterns show that at high-water slack the flow out of Mill Cove at the west entrance was slightly out of phase with the main channel. At low-water slack at the west entrance, flow in Mill Cove reached slack slightly ahead of the main channel. This difference continued to increase, moving toward the east entrance until the low- and high-water slacks occurred approximately 2 hr earlier in the east entrance than in the main navigation channel. Because of these phasing changes in Mill Cove, detailed comparisons of the surface current patterns must be done with care. The times of maximum or slack currents will occur at significantly different times of the tidal cycle, particularly when comparing the base with plan results. Inspection of the time histories of the flow patterns in Mill Cove show that each of the plans resulted in significant increases in flow through Mill Cove.

65. Flow predominance values shown in Figure 13 and maximum current velocities shown in Figure 14 and Table 2 again show that each plan effected generally the same results. At the entrance (sta MCA) to the lower portion of Mill Cove, the plans caused a change from essential balanced flow to a significant ebb predominance on the surface with

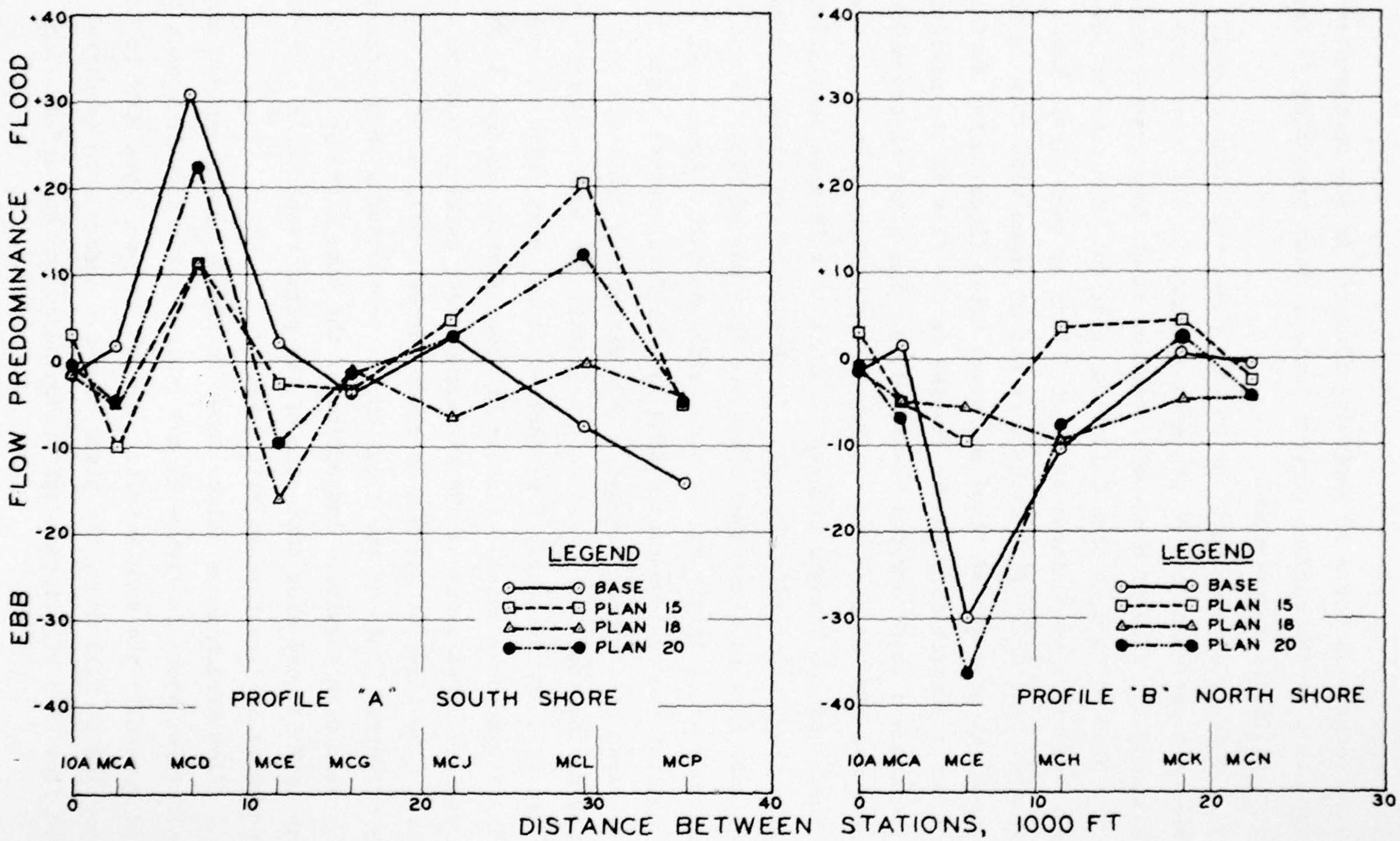

Figure 13. Flow predominance profiles, Mill Cove, south and north shores

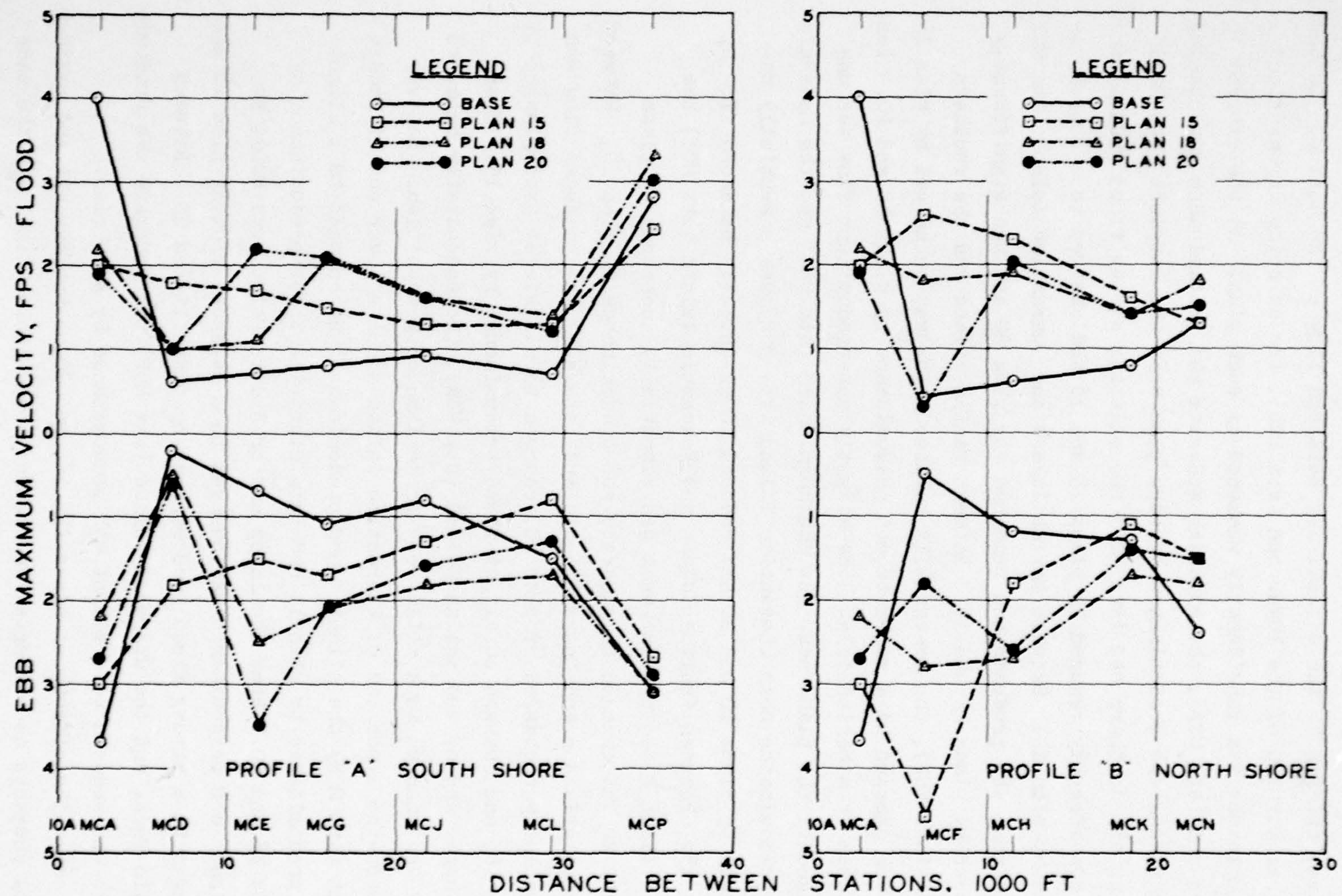

Figure 14. Maximum current velocity profiles, Mill Cove, south and north shores

minimal changes to the essentially balanced flow at the bottom. In the central portion of the lower end (sta MCD), the existing strong flood predominance was considerably weakened by each plan. At the extreme lower end (sta MCB), the existing moderate ebb predominance was changed to a strong ebb predominance by each plan near the entrance (sta MCB) and at the southern end (sta MCC) the existing strong flood predominance was considerably reduced by plans 15 and 18 and changed to ebb predominance by plan 20. Between Marian Island and Quarantine Island (sta MCF) the strong ebb predominance remained for plan 20 and was significantly reduced by plans 15 and 18. Between Marian Island and the southern shore (sta MCE), the essentially balanced flow was unchanged by plan 15 and was changed to a moderate ebb predominance by plans 18 and 20. Just upstream from Marian Island the slightly ebb-predominant flow was unchanged by the plans near the southern shore (sta MCG) and the moderate ebb predominance near Quarantine Island (sta MCH) was essentially unchanged by plans 18 and 20 and reduced to essentially balanced flow by plan 15. Between Pauline Island and Newcastle Island (sta MCJ) the very slight flood predominance was essentially unchanged by plans 15 and 20 but changed to moderate ebb predominance by plan 18. Between Newcastle Island and Quarantine Island (sta MCK) the balanced flow was essentially unchanged by plan 20, changed to slight ebb predominance by plan 18, and changed to slight flood predominance by plan 15. Near the upper end of Quarantine Island (sta MCN), the essentially balanced flow was changed to a slight ebb predominance by each plan. Halfway between the upper end of Quarantine Island and the lower end of Reddie Point (sta MCM) the slight flood predominance was changed to a slight ebb predominance by plan 15 and to a significant ebb predominance by plans 18 and 20. Near the lower end of Reddie Point (sta MCL), the moderate ebb predominance was changed to a balanced flow by plan 18 and changed to a strong flood predominance by plans 15 and 20. Between Reddie Point and the disposal island (sta MCP) the moderate ebb predominance was reduced to a slight ebb predominance by each plan.

66. The effects of plans 15, 18, and 20 on maximum ebb and maximum flood currents as presented in Figure 14 and Table 2 followed the same

general trend, with the exception of stations located in the immediate vicinity of the east entrance. The general trend was increased maximum current velocities. Data for sta MCA (Table 2), located on the center axis of the weir, showed significant decreases in velocity as expected. Base conditions at this location consisted of a weir opening 150 ft wide by 12 ft deep, whereas each of the plans investigated had an opening 1,300 ft wide by 12 ft deep. One of the major concerns was maximum velocities through the weir opening. From data furnished by the Jacksonville District it was determined that a velocity magnitude in the area of about 2.5 fps would be desirable. Velocities lower than 2.5 fps could result in shoaling of the weir opening and velocities greater than 2.5 fps could result in excessive scour in the opening. Each of the above plans (15, 18, and 20) resulted in maximum velocities through the weir opening that would be acceptable. However, plan 20 appears to be the most satisfactory in this respect as maximum flood currents averaged about 1.9 fps and maximum ebb currents averaged about 2.7 fps. The average maximum ebb and flood velocities at this station for plan 15 were about 3.0 fps and 2.0 fps, respectively. Plan 18 resulted in average maximum velocities at this location of 2.2 fps for both the ebb and flood directions. The 3.0-fps maximum ebb velocity associated with plan 15 could possibly result in scouring in the opening during ebb flow, while the 2.2-fps maximum velocity associated with plan 18 could result in shoaling in the weir opening.

67. Another critical velocity area was located between Reddie Point and the disposal island (sta MCP) at the west end of the cove. Maximum velocities through this area, or in the weir opening, should be about 2.5 fps; and again, each of the three plans was within acceptable limits. However, in this case plan 15 appeared to be the optimum plan, as maximum velocities (Table 2) were 2.7 fps and 2.4 fps for ebb and flood directions, respectively. Both plans 18 and 20 resulted in maximum velocities of about 3.0 fps. It is noted that base condition maximum current velocities through this area were about 3.0 fps in both the ebb and flood directions, and no significant change has occurred in the prototype. Therefore it is reasonable to assume that neither of the

three plans would result in scouring this area to any detrimental degree. Plan 15, involving the construction of a triangular-shaped disposal island located inside the weir opening in Mill Cove, would however result in excessive ebb velocities at sta MCF between the proposed triangular island and the lower end of Quarantine Island (4.6 fps maximum). Excessive velocities at this point would probably cause extensive scouring of the cross section between the disposal island and Quarantine Island, thus requiring some type of bank protection if plan 15 were installed in the prototype. Even then, bottom scour would most likely result and eventually usurp the flow that is diverted around the east side of the new triangular island. This would eventually result in further lowering the presently low velocities in the east end of Mill Cove and in magnifying the siltation and flushing problems existing in that area of the cove. All model tests were conducted with a fixed-bed configuration. As mentioned in paragraph 36, it was not possible to conduct fixed-bed shoaling tests in Mill Cove; therefore no scour or filling rates or patterns could be determined by direct model tests. Time and funding constraints precluded testing other alignments or different sizes of the triangular island located inside the weir.

68. In general, maximum current velocities through Mill Cove, excluding sta MCA, MCE, MCF, and MCP, averaged about 1.5 fps in both the ebb and flood directions, while base condition maximum current velocities though the cove averaged about 0.8 fps. Plan 15 resulted in undesirable maximum ebb current velocities at sta MCA, MCF, and MCP of 3.0 fps, 4.6 fps, and 2.7 fps, respectively. Undesirable maximum flood current velocities of 2.6 fps with plan 15 were observed at sta MCF only. Plan 18 resulted in undesirable maximum ebb current velocities at sta MCF, MCH, and MCP of 2.8 fps, 2.7 fps, and 3.1 fps, respectively. Undesirable flood maximum velocities of 2.0 fps and 3.3 fps were noted with plan 18 at sta MCF and MCP, respectively. Plan 20 resulted in undesirable maximum ebb current velocities at sta MCA, MCE, MCH, and MCP of 2.7 fps, 3.5 fps, 2.6 fps, and 2.9 fps, respectively. Plan 20 resulted in adverse maximum flood current velocities at only one location

(MCP) of 3.0 fps. In view of the discussion in paragraph 67 above, it is not likely that plan 18 or 20 would result in excessive scour in any area of the cove; however, plan 15 would probably result in severe scour in the vicinity of sta MCF.

69. The greatest effects on current conditions in Mill Cove were in respect to phasing. During base conditions the tidal prism of Mill Cove was satisfied primarily through the wide shallow opening located at the west end of the cove. This situation resulted in currents and resulting slack periods in Mill Cove running in opposite directions and out of phase with observed currents in the navigation channel for as long as 2-5 hr. Each of the three plans investigated resulted in a much better synchronization of Mill Cove and navigation channel currents and slack periods. No one particular plan resulted in any obviously significant improvement over the other in this respect.

Salinities

70. The effects of plans 15, 18, and 20 on hourly salinity concentrations are shown in Plates 31-53. The effects of these plans on average salinity concentrations at locations along the navigation channel center line and in Mill Cove are shown in Figures 15-19 and in Table 3. The changes in average salinity due to each of the three plans are shown in Figures 20-24. Changes for minimum and maximum salinities are shown in Figures 25-29 and 30-34, respectively. These latter data (Figures 25-34) are the differences in the maximum and minimum salinities that occurred during the tidal cycle between plan test results and base test results. The plans also caused changes in the time the maximum and minimum salinities occurred; therefore the time in the tidal cycle that the maximum and minimum salinities occurred is not necessarily the same for base and plan tests.

71. The accuracy of determining salinity concentrations from samples obtained from the model is controlled by two factors. The salinity of the ocean portion of the model is primarily dictated by the salinity of the water in the model sump. The sump salinity was

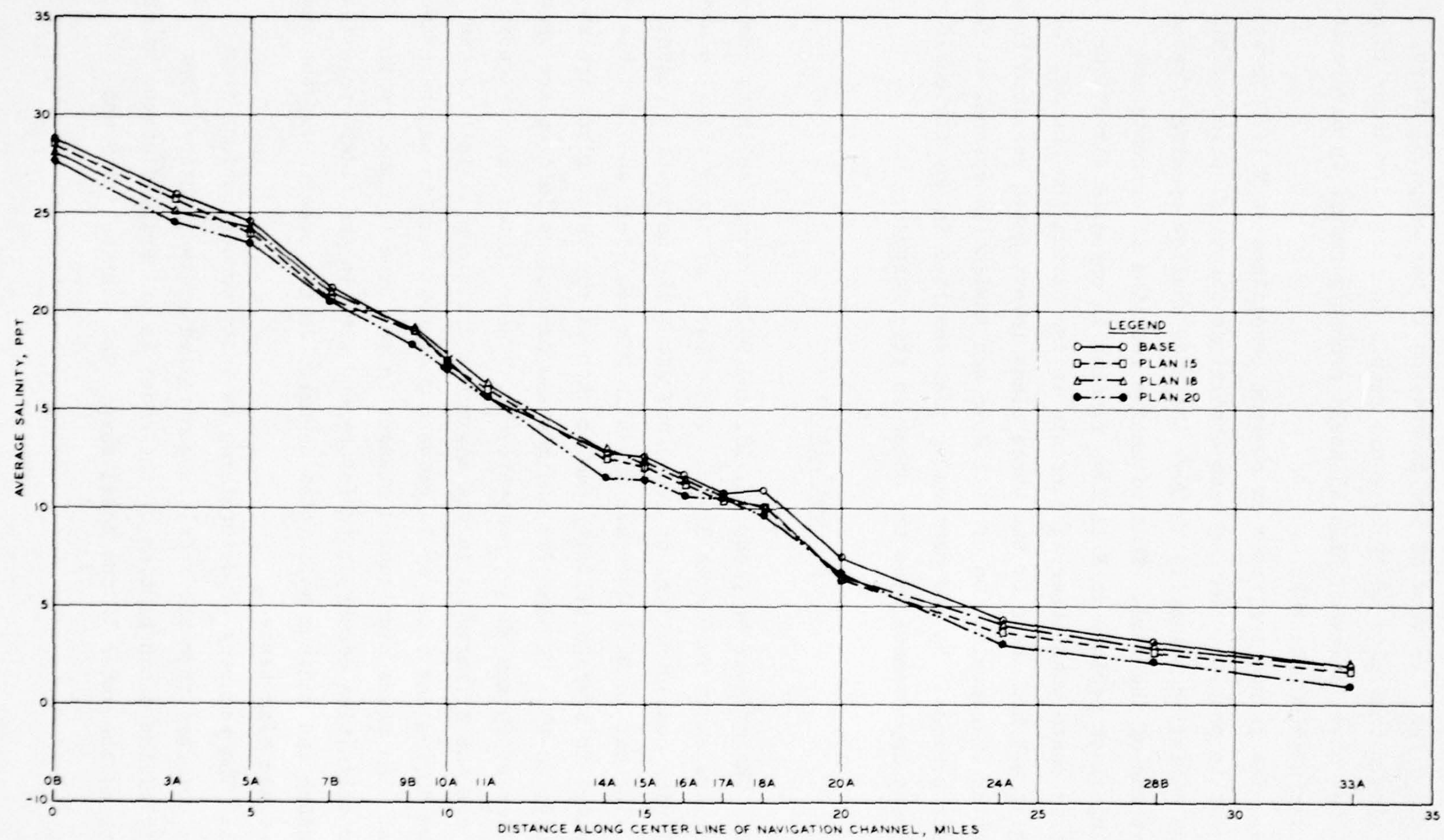

Figure 15. Average salinity profile, center-line channel stations

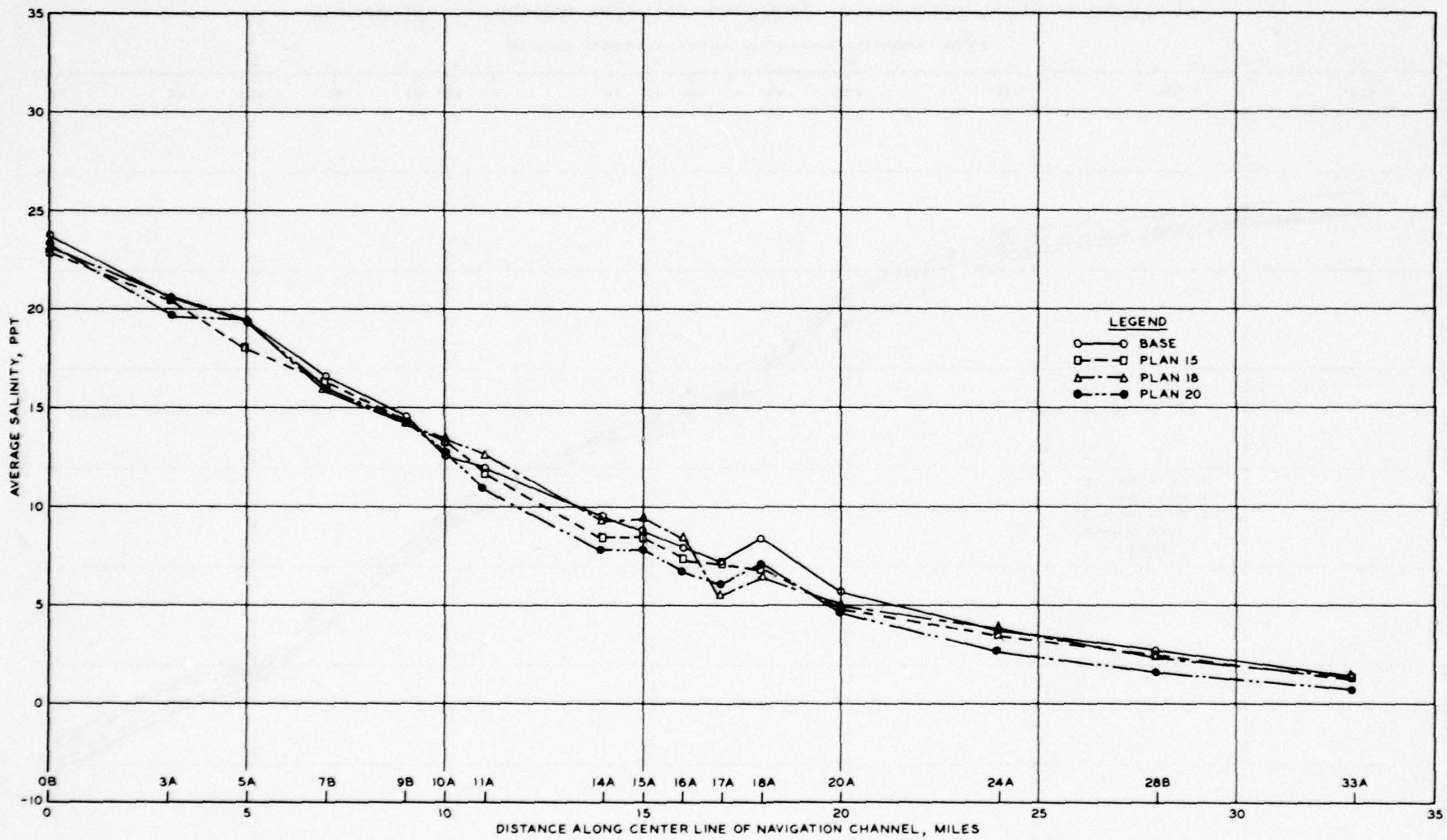

Figure 16. Surface depth salinity profile, center-line channel stations

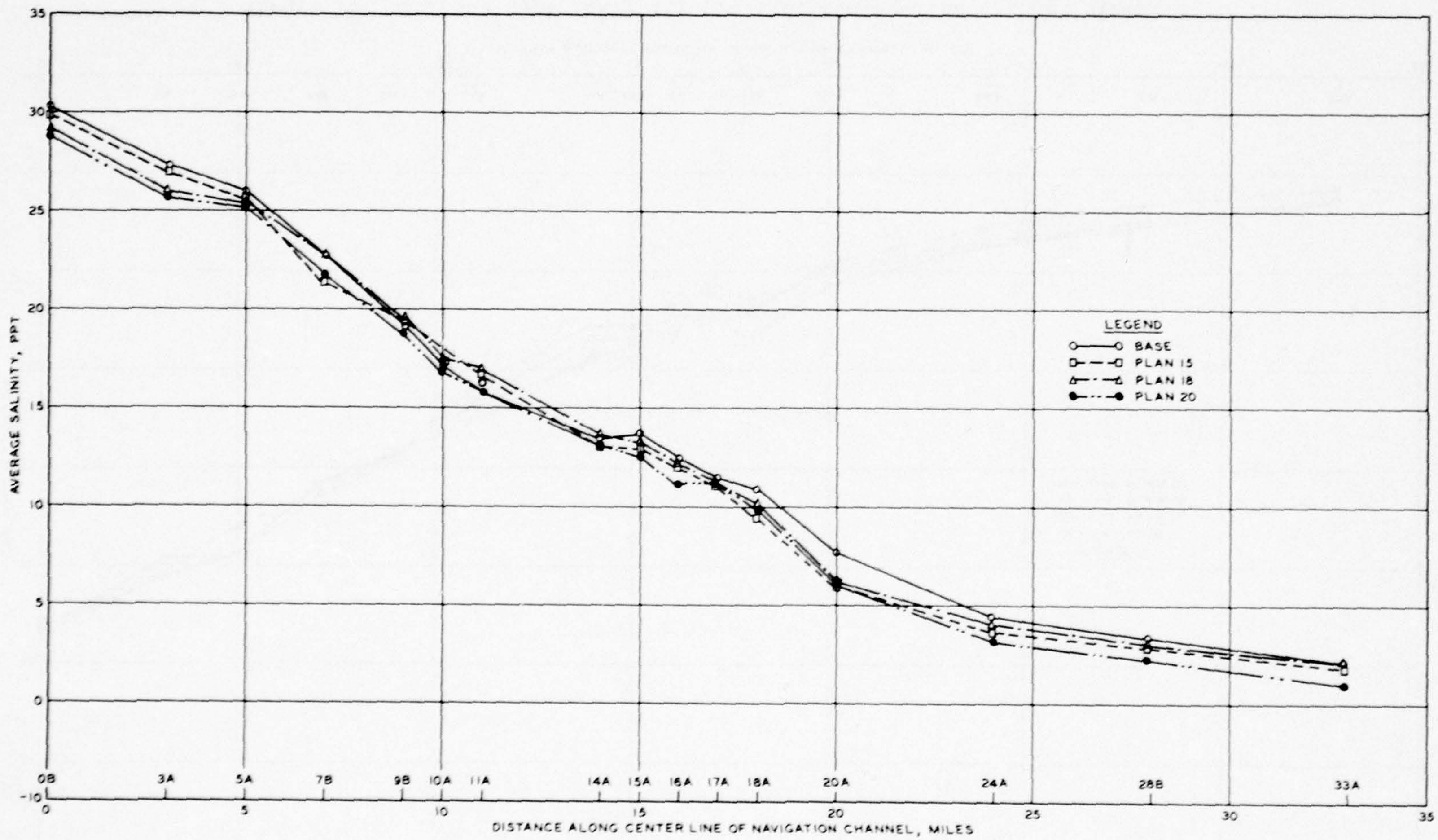

Figure 17. Middepth salinity profile, center-line channel stations

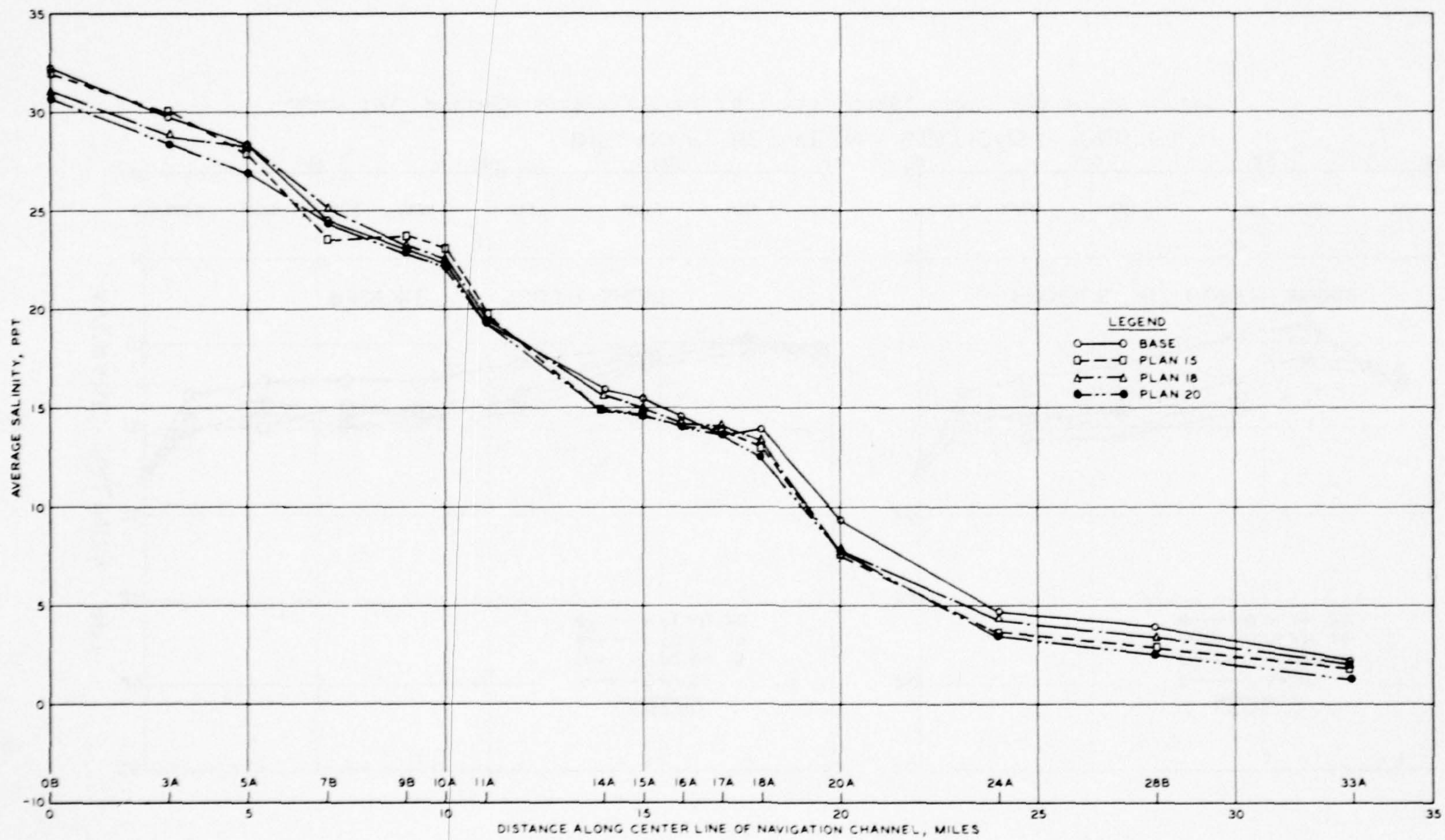

Figure 18. Bottom depth salinity profile, center-line channel stations

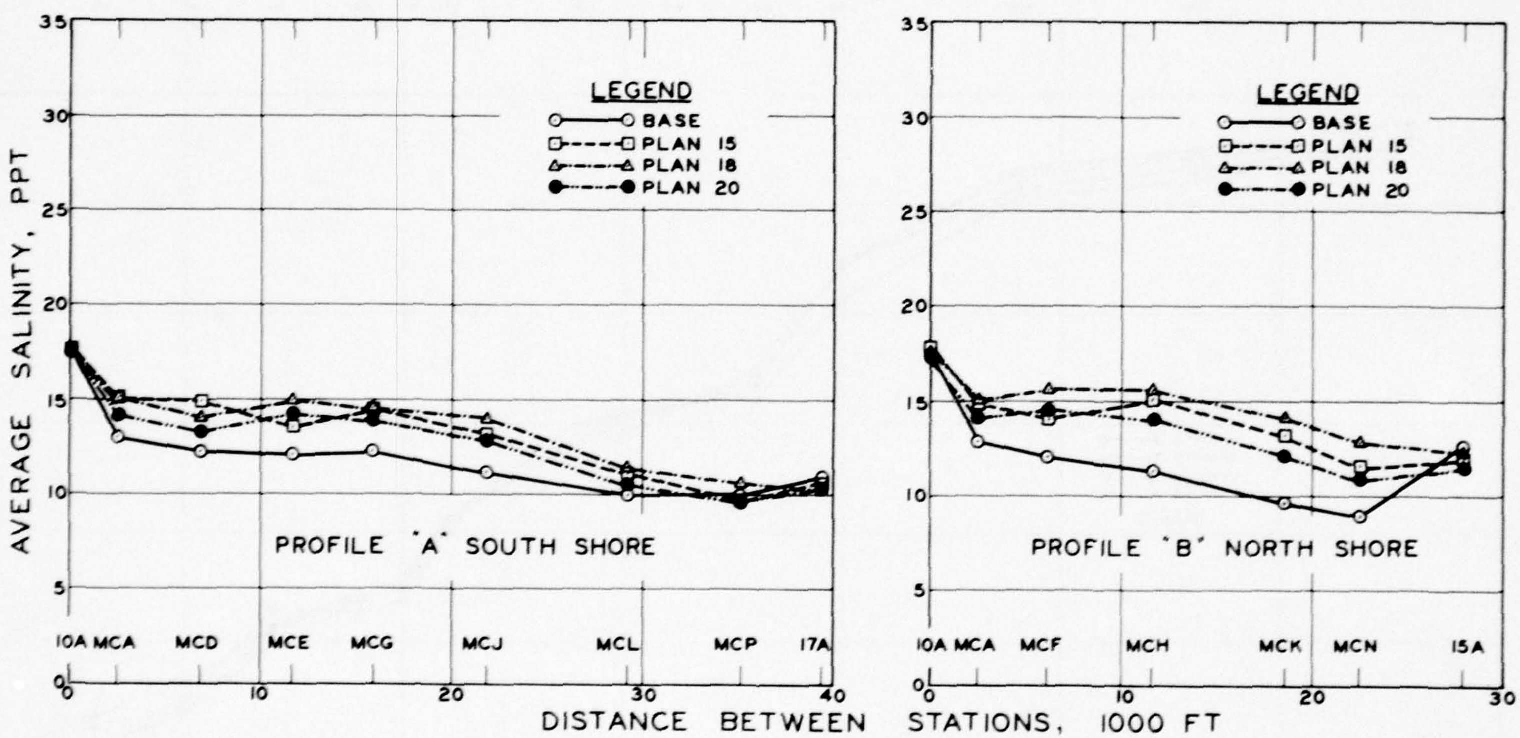

Figure 19. Average salinity profiles, Mill Cove, south and north shores

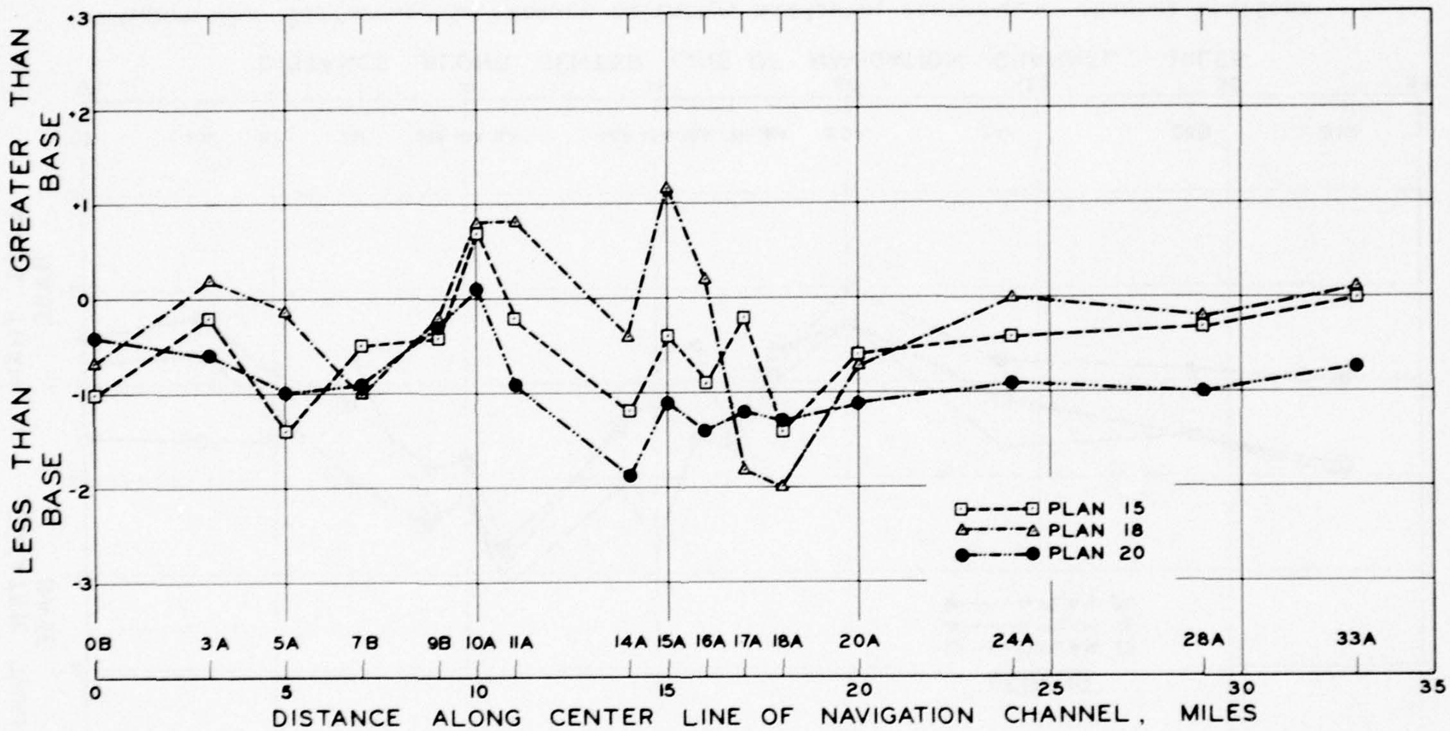

Figure 20. Difference in average salinity, surface depth; center-line channel stations

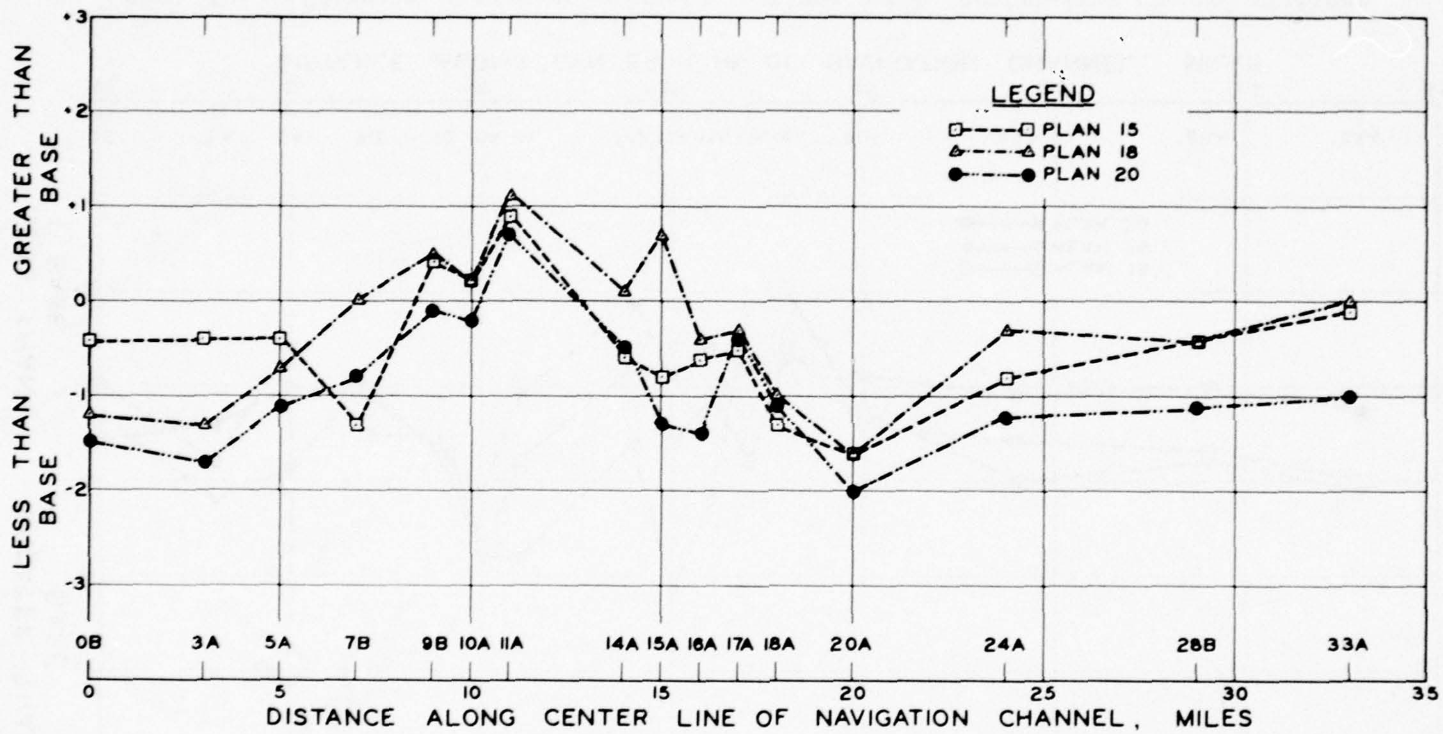

Figure 21. Difference in average salinity, middepth; center-line channel stations

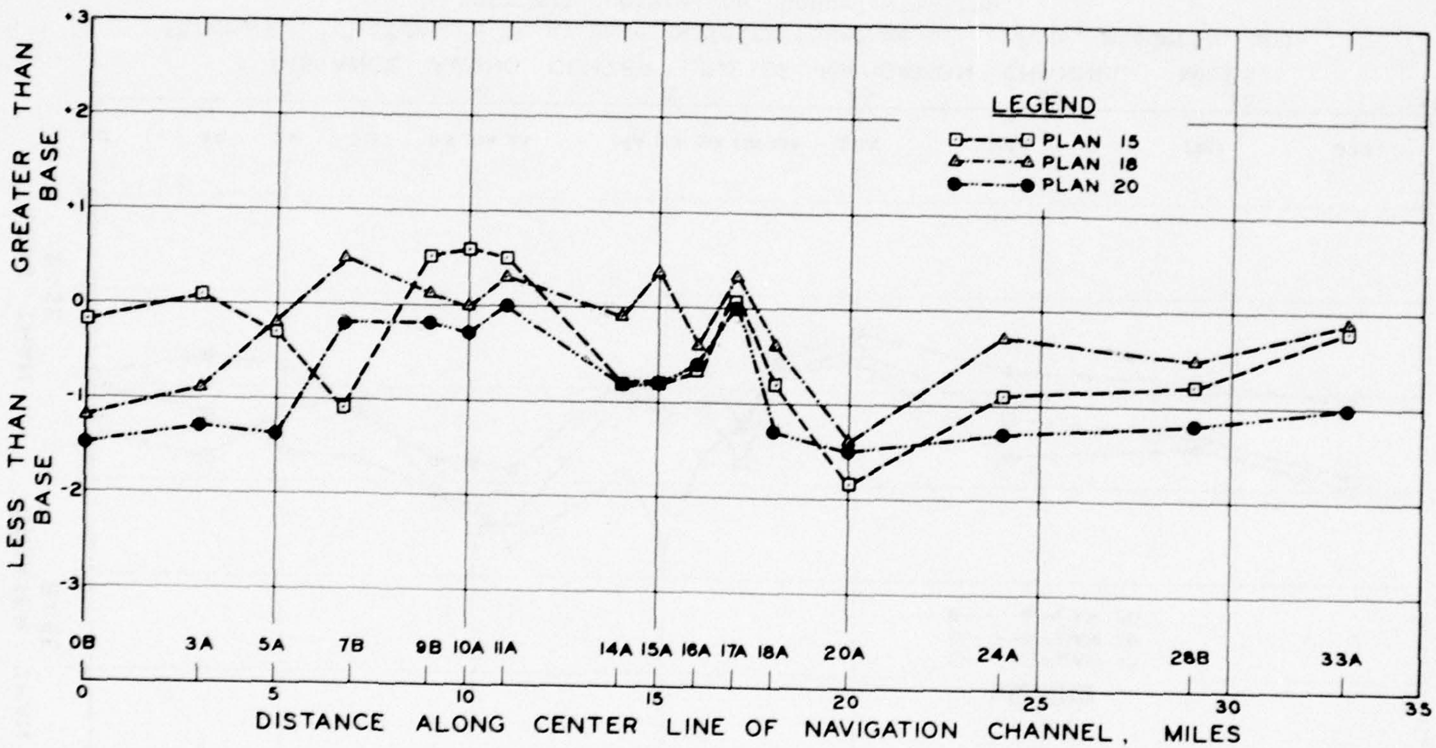

Figure 22. Difference in average salinity, bottom depth; center-line channel stations

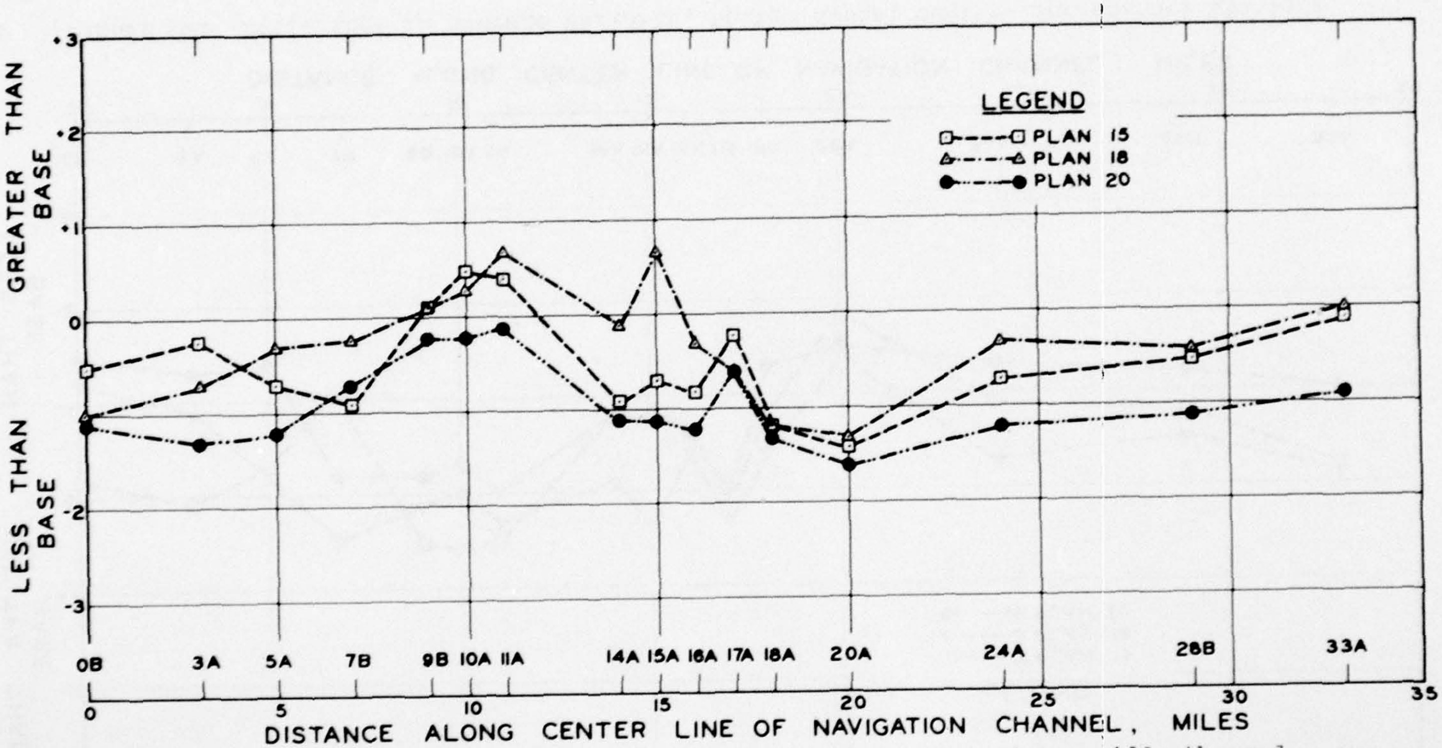

Figure 23. Difference in average salinity (average of surface, middepth, and bottom); center-line channel stations

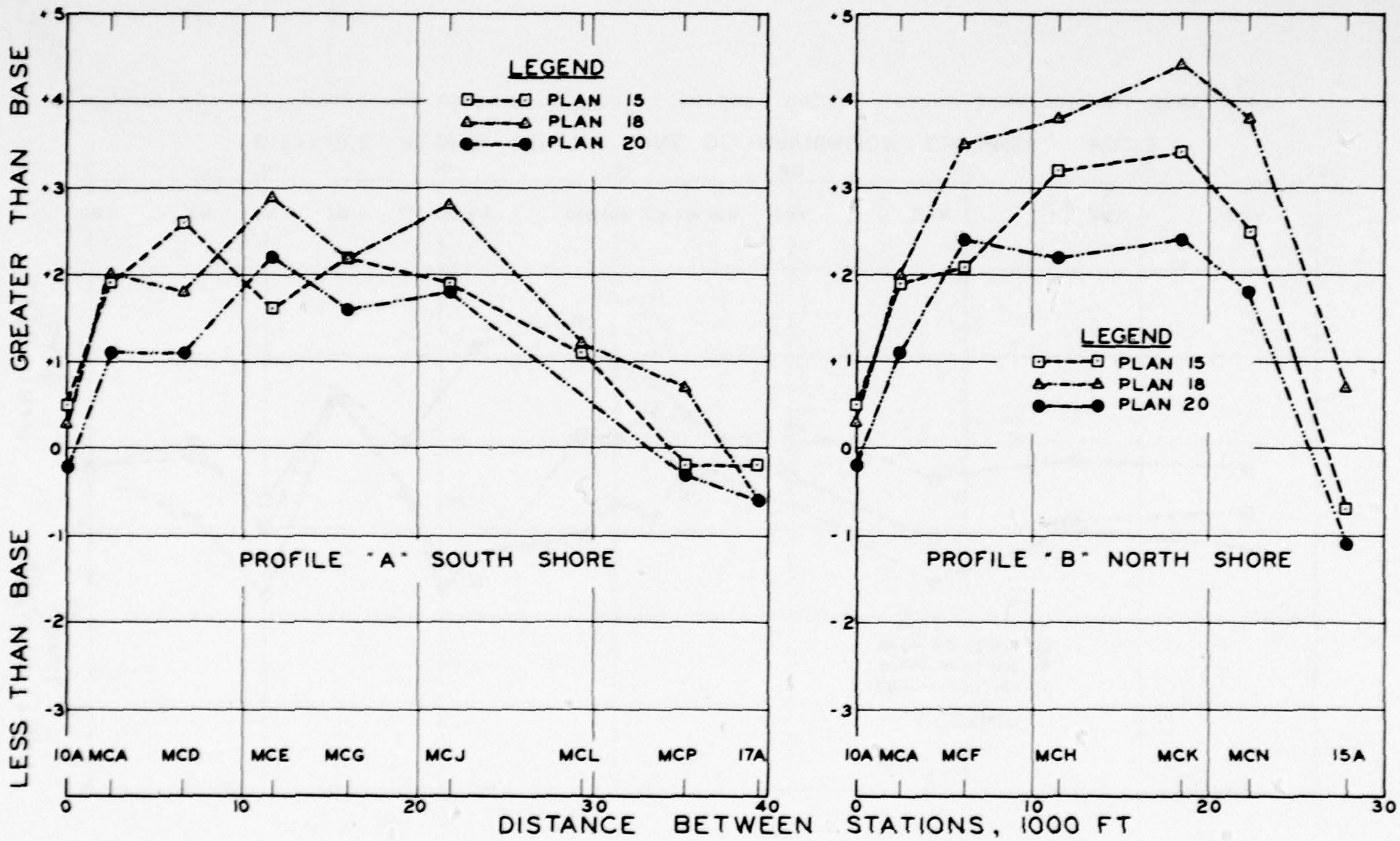

Figure 24. Difference in average salinities, Mill Cove, south and north shores

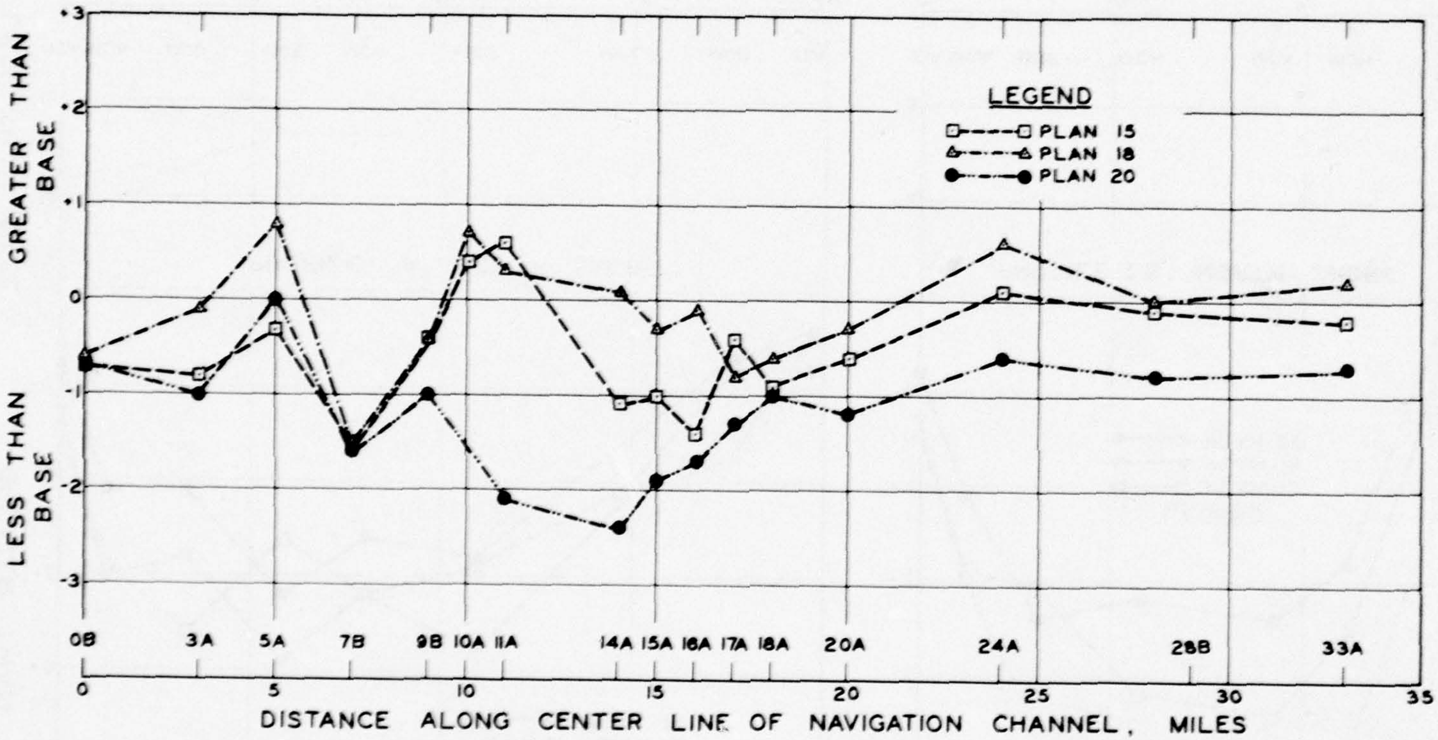

Figure 25. Difference in minimum salinity, surface depth; center-line channel stations

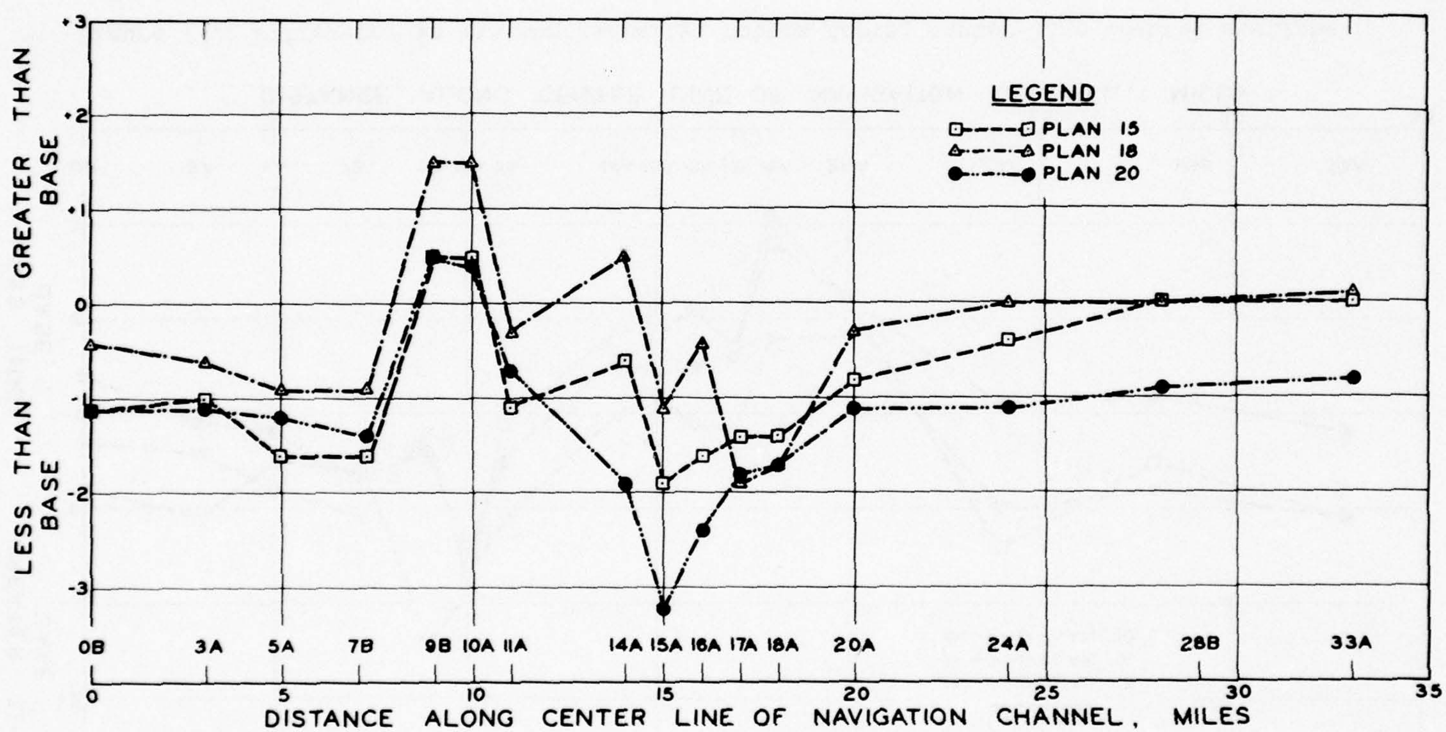

Figure 26. Difference in minimum salinity, middepth; center-line channel stations

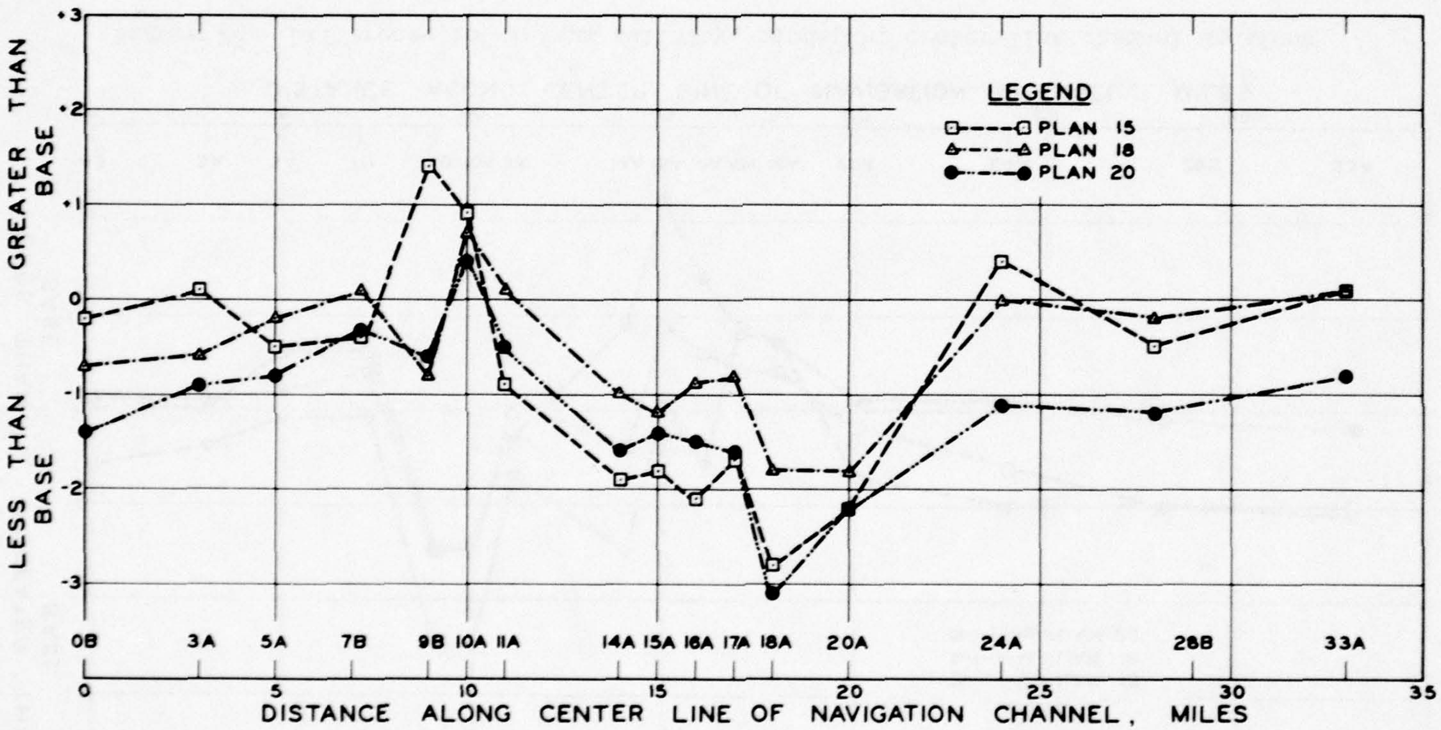

Figure 27. Difference in minimum salinity, bottom depth; center-line channel stations

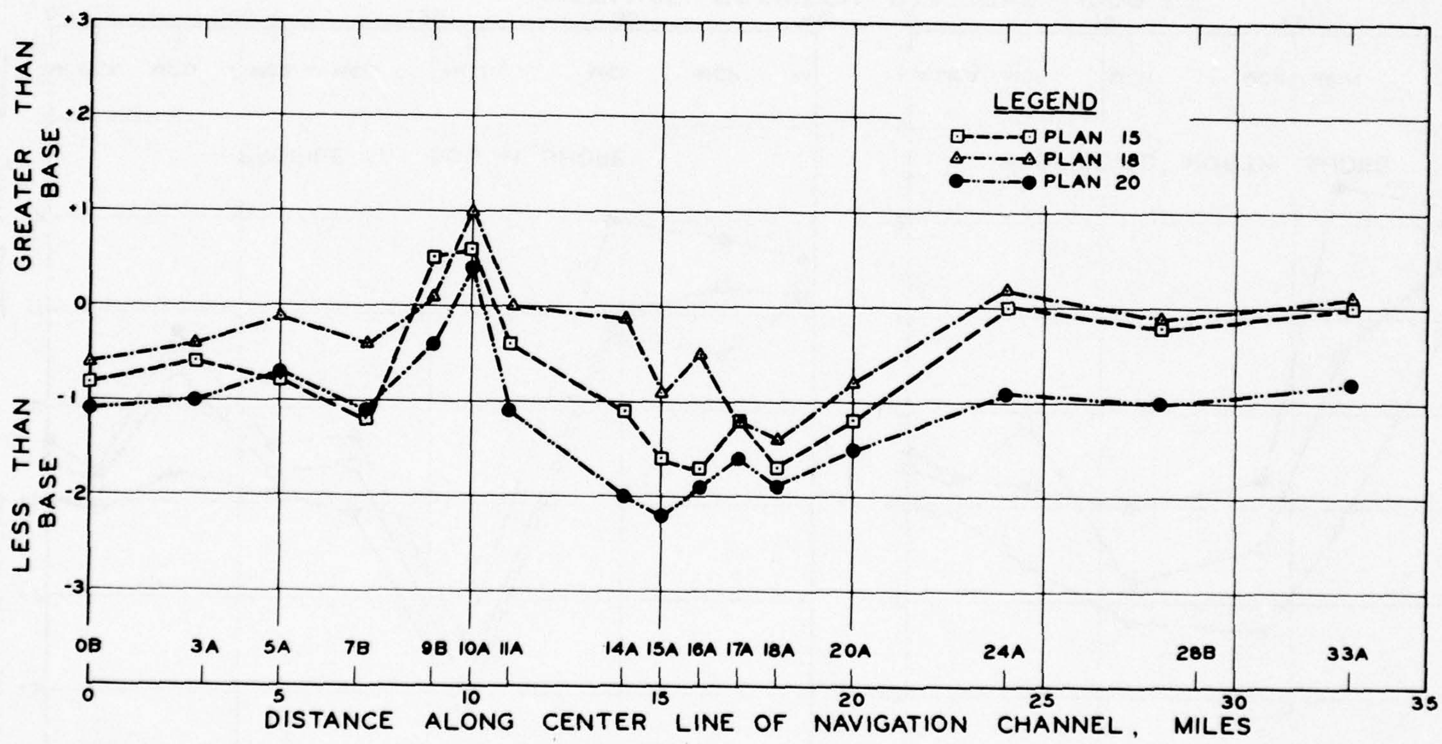

Figure 28. Difference in minimum salinity average (surface, middepth, and bottom); center-line channel stations

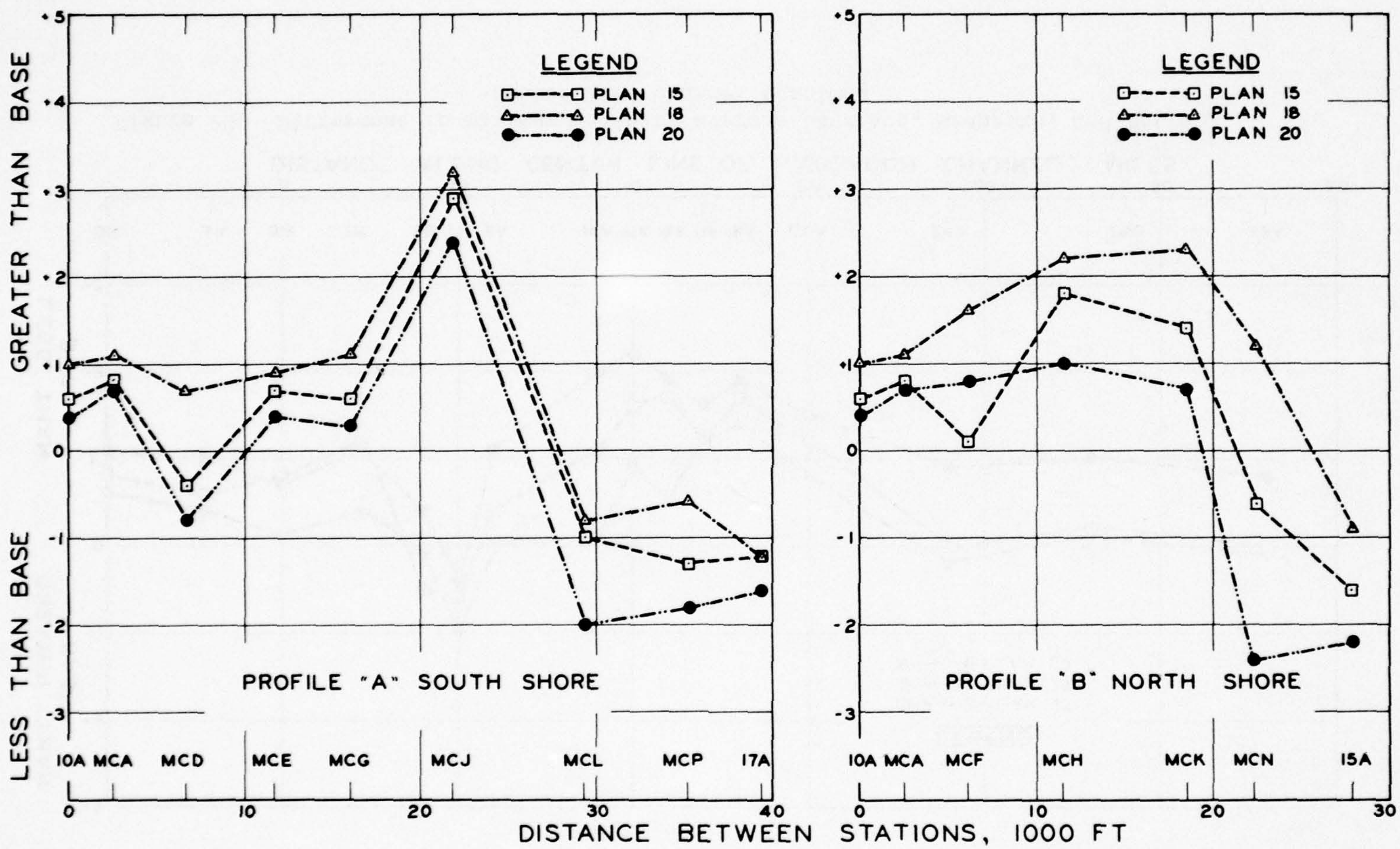

Figure 29. Difference in minimum salinities, Mill Cove, south and north shores

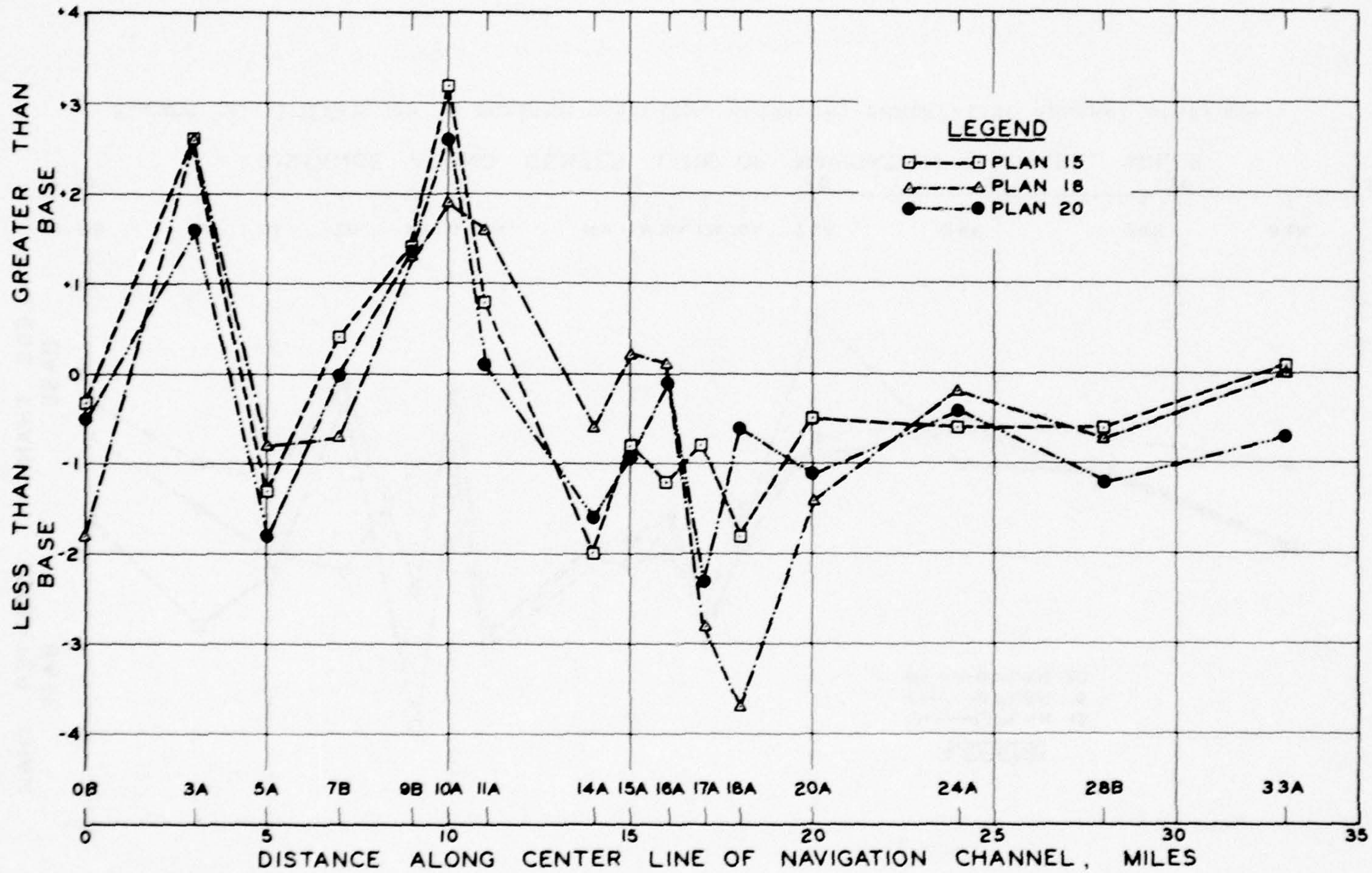

Figure 30. Difference in maximum salinity, surface depth; center-line channel stations

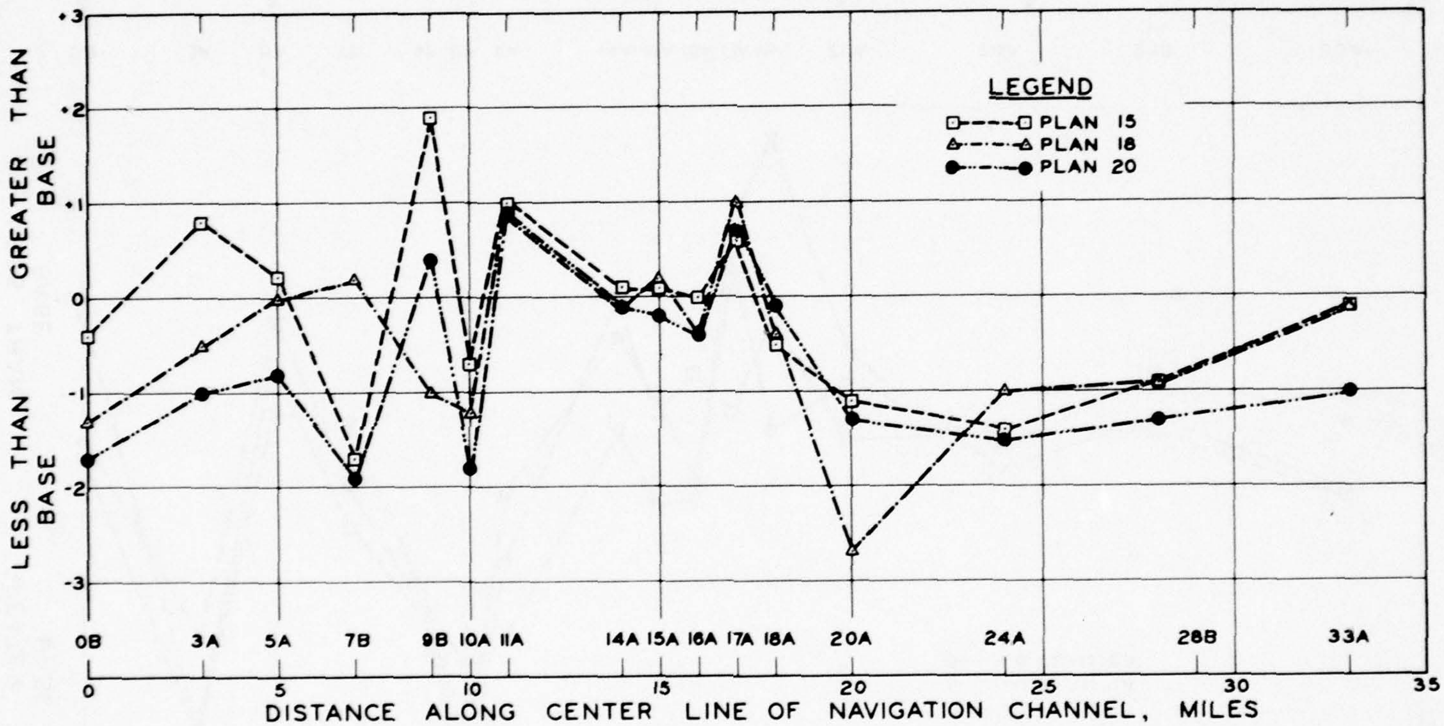

Figure 31. Difference in maximum salinity, middepth; center-line channel stations

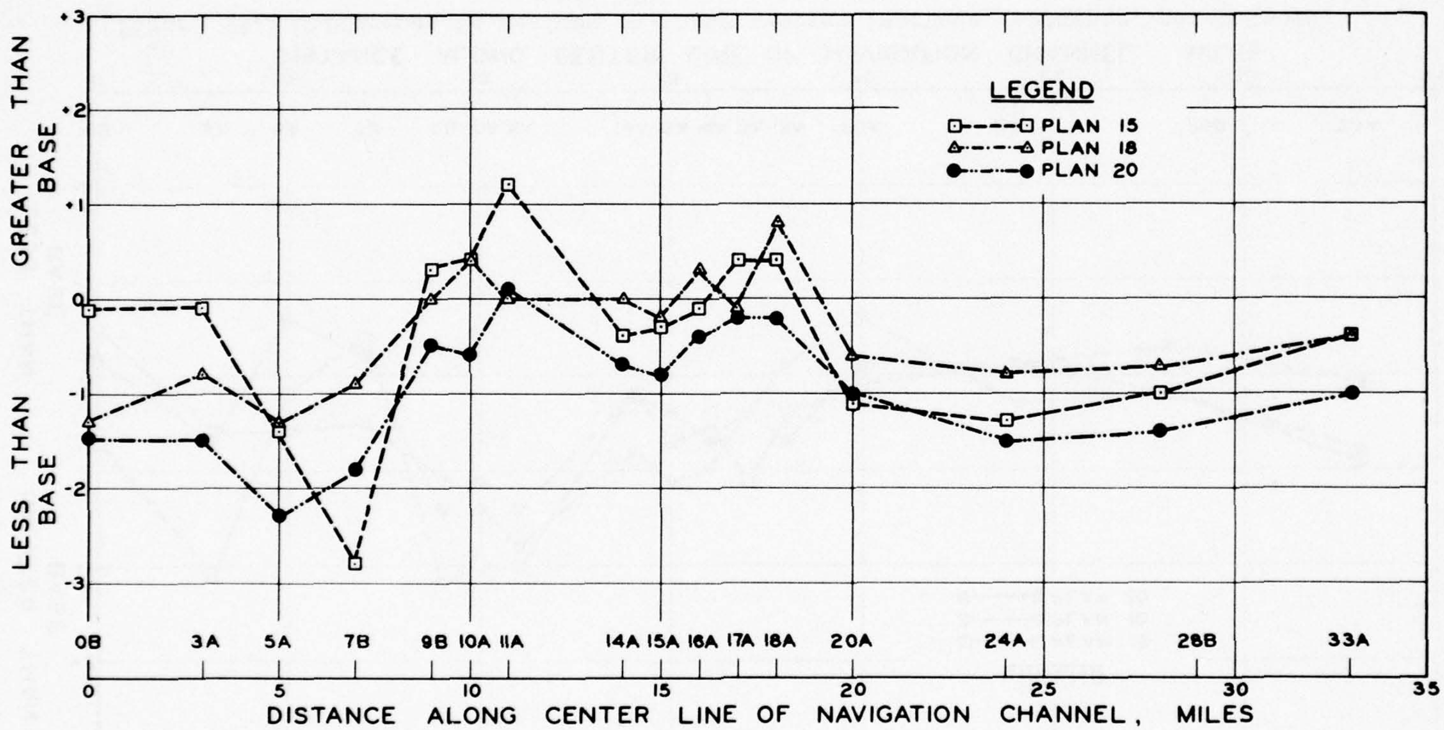

Figure 32. Difference in maximum salinity, bottom depth; center-line channel stations

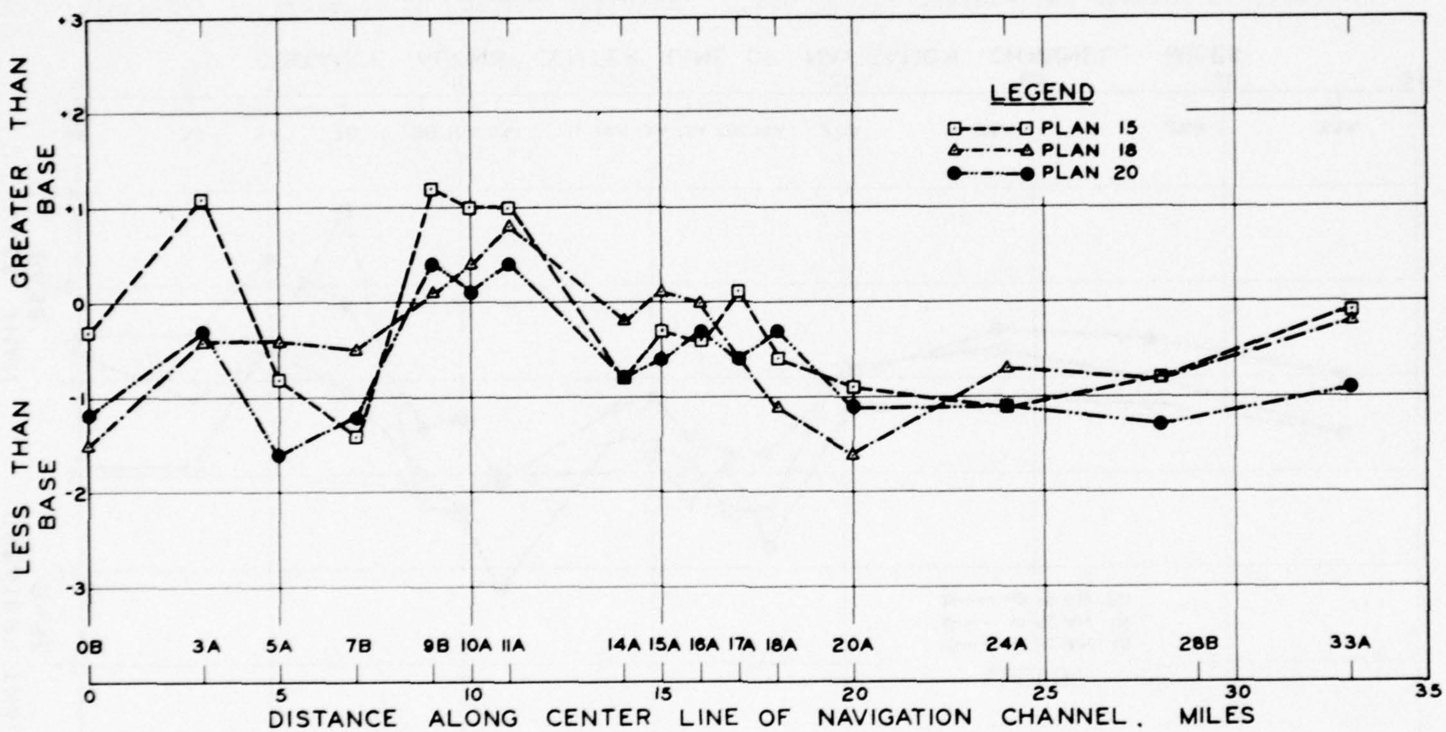

Figure 33. Difference in maximum salinity average (surface, middepth, and bottom); center-line channel stations

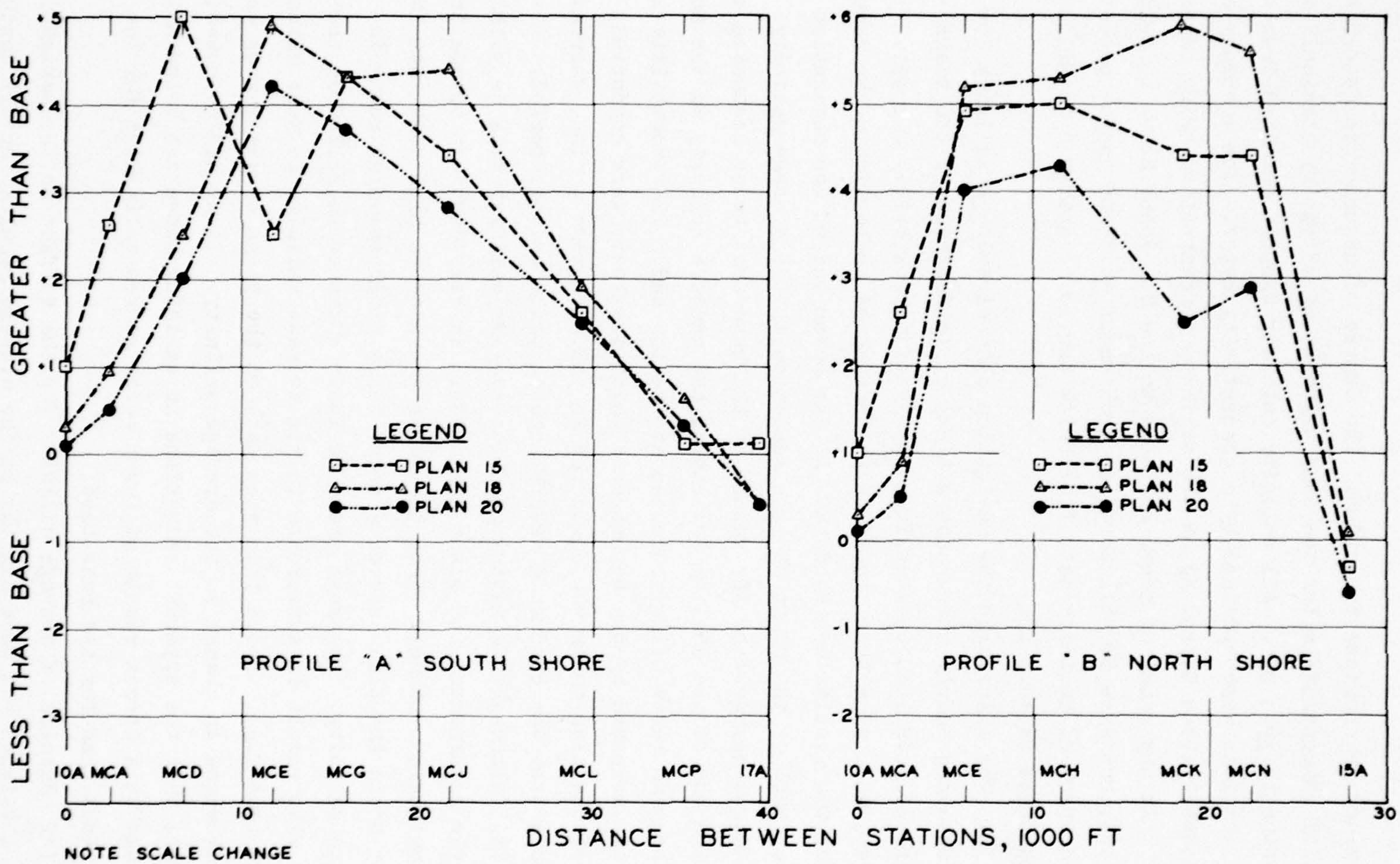

Figure 34. Difference in maximum salinities, Mill Cove, south and north shores

determined by chemical titration. The degree of accuracy in determining salinity concentration for the sump salinity of 33 ppt by chemical titration is ±0.5 ppt. All salinity data for samples obtained from the model stations were obtained by a conductivity meter. The accuracy of these data varies depending on the salinity concentration being determined. In the range of ocean entrance to the St. Johns River to below the lower entrance to Mill Cove, accuracies of ±0.5 ppt can be expected. The accuracy of salinity data from below the lower entrance to Mill Cove and upstream is ±0.3 ppt.

72. The changes in the navigation channel average salinity for all data obtained hourly throughout a tidal cycle for each of the plans (Figure 30) resulted in a maximum change of approximately 1.5 ppt. However, the majority of the data is considered to be within the accuracy of the results of the data. At the ocean end of the navigation channel each of the plans shows a reduction in the average salinity. The changes may well be the result of the base test being conducted at the high end of the ability to control and measure salinity in the model and the plan tests being conducted at the low end. The probability of this is increased by the sequence in which the tests were conducted. Each of the plan tests was conducted in the same time period, whereas the base test was conducted several months prior to this period.

73. Although the majority of the average salinity data is within possible accuracies, the plans data result in very distinct trends in the navigation channel. From the lower entrance to Mill Cove (sta 10A) to the ocean the plans caused a trend for a progressive decrease in average salinity. Upstream from the lower entrance to Mill Cove the plans also result in a decrease in the average salinity to near Mathews Bridge (sta 20A). Above this area each of the plans caused a progressive decrease in change to the average salinity. It should be noted, however, that the apparent reductions in salinity above and below Mill Cove may be a direct result of lower ocean source salinities for the plan tests than for the base test.

74. Results of average salinity for the surface in the navigation channel (Figure 20) were similar to the average results for all depths

(Figure 23); however, the location of the maximum salinity decrease above the upper entrance to Mill Cove was closer to Mill Cove (from sta 20A to 18A). Results of the average salinity data for the middepth and bottom in the navigation channel (Figures 21 and 22) followed the same general trend as the average for all depths with the locations of largest reductions (sta 0B, 3A, and 20A) being somewhat larger than for the average for all depths.

75. The location of the largest decrease in average minimum salinities (Figure 28) throughout the tidal cycle occurred in the area of the western entrance to Mill Cove and above (sta 15 to 18A). The maximum decreases measured were 2.2 ppt for plan 20 at sta 15, 1.7 ppt for plan 15 at sta 16A and 18A, and 1.4 ppt for plan 18 at sta 18A. The only area to result in an increase for each plan was at the eastern entrance (sta 10A) to Mill Cove. At this location plans 15 and 20 increased the average minimum salinity approximately 0.5 ppt, and plan 18 increased it by 1.0 ppt. The general trends in the changes were otherwise similar to the trends for the average salinity data (Figure 23). In general, the pattern of minimum salinity changes for surface (Figure 25) and middepth (Figure 26) were similar to the average minimum salinity changes (Figure 28).

76. In general, the plans caused changes in the average maximum salinities (Figure 28) similar to the average salinity changes. A discontinuity occurred at sta 3A for each plan and the location of largest decrease above the western entrance to Mill Cove varied with the plan. Plans 15, 18, and 20 caused maximum decreases above the western entrance at sta 24A, 20A, and 28B, respectively.

77. The largest increases in maximum salinities at the surface (Figure 30) occurred at sta 3A and 10A (eastern entrance to Mill Cove). The plans caused increases from approximately 1.5 ppt to approximately 3.0 ppt. The location of the maximum decrease for plans 18 and 20 was upstream from the western entrance to Mill Cove at sta 18A and 17A, respectively. Plan 15 caused the largest decreases of approximately the same level at sta 14A and 18A, upstream of the eastern and western entrances to Mill Cove, respectively.

78. The major changes due to the plans for the maximum salinity at middepth (Figure 31) occurred near each entrance to Mill Cove. At the eastern entrance (sta 10A), a decrease in the maximum salinity occurred for each plan. In both directions from the eastern entrance (sta 9B and 11A) the plans caused increases in maximum salinity (plan 20 caused an increase at sta 7B as opposed to sta 9B for plans 15 and 18). Immediately upstream from the western entrance to Mill Cove (sta 17A), a slight increase in salinity for each plan occurred with decreases of 1.0 ppt or greater occurring from sta 20A to 28B.

79. The major change in maximum salinity near the bottom (Figure 32) that occurred when compared with average maximum salinity changes was a shift of the location where no change occurred for plans 15 and 18 near the western entrance to Mill Cove. The transition occurred between sta 18A and 20A at the bottom.

80. In considering the influence of the plans on changes in maximum and minimum salinities, recognition must be given to the increased probability of experimental error as opposed to considering changes in average salinities throughout the tidal cycle. These data are a result of a single sample that is obtained from the model during the tidal cycle that resulted in the maximum or minimum salinity. Variations in the data can occur due to the accuracy with which the salinity can be determined or in the timing of taking the sample. If the salinity is changing rapidly at the time the sample is obtained, the time of actual maximum or minimum salinity could be between sampling times. Inspection of the phasing of the salinity time histories (Plates 31-53) shows that the plans result in changes to the phasing. At several stations, not only is the time that maximum or minimum salinities occurred different for the base and each plan test, but they could have occurred at the time samples are taken in one test and between sample times for the next test. Nonetheless, the general shape of the salinity difference curve is quite consistent for all depths and all test conditions.

81. Inspection of the salinity time histories (Plates 31-53) shows that each of the plans does change the phasing. These changes are in general agreement with the changes in phasing observed for the velocity

data. Thus, slight phasing changes are observed downstream of the western entrance to the cove.

82. The effects of plans 15, 18, and 20 on hourly salinity concentrations in Mill Cove are shown in Plates 48-53. Average salinity concentration values averaged over a complete tidal cycle are shown in Table 3. Profiles of average salinities in Mill Cove are presented in Figure 19.

83. Average salinity concentrations throughout Mill Cove were generally increased with the installation of each plan, with the exception of only a few stations (Table 3). Average salinity concentrations at sta MCB, with plans 15 and 20 installed, were decreased slightly, 0.1 ppt and 0.5 ppt, respectively. Likewise, sta MCP resulted in a small reduction of 0.2 ppt and 0.3 ppt for the above two plans, respectively. Maximum effects were observed in the central portion of Mill Cove (generally 2-4 ppt), while minimum effects were observed at the east and west ends of the cove (generally less than 2 ppt).

84. Average salinity concentrations throughout Mill Cove were increased by about 1.7 ppt, 2.3 ppt, and 1.2 ppt with the installation of plans 15, 18, and 20, respectively. With base conditions installed, average salinity concentrations throughout the cove were about 11.3 ppt; and as shown in Plates 48-53, there was a very small fluctuation from the average throughout the tidal cycle (except at sta MCA). However, with the installation of the plans the fluctuation from maximum to minimum was increased considerably, particularly in the central area of Mill Cove.

85. Base condition salinity concentrations in Mill Cove were controlled or influenced primarily by the tidal flow entering through the western end of the cove. Average salinity concentrations in this area of the model (miles 14-17) at the surface and middepth were about 8.0 ppt and 12.5 ppt, respectively, the depths from which the tidal prism in Mill Cove was satisfied. With the installation of each of the proposed plans, the potential for supplying flow into Mill Cove during the flood phase of the tidal cycle was significantly increased for the east opening (mile 10). Salinity concentrations in the navigation channel at

mile 10 averaged approximately 5 ppt higher than those at the west end of Mill Cove. Plan condition average surface salinity concentrations at sta 10A, located in the channel opposite the weir opening, was about 13.0 ppt and was reasonably close to the average throughout Mill Cove with the plans installed. The substantial increase at all cove stations can be seen in the average salinity profiles in Figure 19.

86. Profiles of the changes in average, minimum, and maximum salinities along the south and north shores of Mill Cove due to each plan are presented in Figures 24, 29, and 34, respectively. Two of the plans (15 and 18) caused an imbalance in the magnitude of the change between the two sides of the cove. Plan 18 resulted in an increase in the average salinity (Figure 24) in the middle portion of the cove along the south shore (sta MCE, MCG, and MCJ) of between 2 and 3 ppt and along the north shore (sta MCF, MCH, and MCK) of between 3.5 and 4.5 ppt. The increases for maximum salinities (Figure 29) were between 4 and 5 ppt and 5 and 6 ppt for the south and north shores, respectively. The changes in minimum salinities along the south shore varied from increases of approximately 1 ppt in the area between Marian Island and Pauline Island (sta MCG) and between Pauline Island and the south shore (sta MCE) to an increase of approximately 3 ppt in the area between Pauline Island and Newcastle Island (sta MCJ). Along the north shore the increase in minimum salinity varied from approximately 1.5 ppt (sta MCF) to between 2 and 2.5 ppt (sta MCH and MCK).

87. In the upper portion of Mill Cove along the south shore (sta MCL) changes in average, maximum, and minimum salinities caused by plan 18 were approximately 1 ppt increase, 2 ppt increase, and 1 ppt decrease, respectively. The north shore changes in the upper portion (sta MCN) for average, maximum, and minimum salinity changes were approximately 4 ppt increase, 5.5 ppt increase, and 1 ppt increase, respectively.

88. Plan 15 also caused an imbalance in the magnitude of salinity increases between the two shores but to a lesser extent than plan 18. The increase in average salinity along the south shore (sta MCE, MCG, and MCJ) was approximately 2 ppt. Along the north shore changes varied

from approximately 2 ppt (sta MCF) to between 3 and 3.5 ppt (sta MCH and MCK). Increases in maximum salinities moving up the middle portion of the cove along the south shore were approximately 3.5 ppt (sta MCJ), 4.5 ppt (MCG), and 2.5 ppt (MCE). Along the north shore in the middle portion (sta MCF, MCH, and MCK), increases in maximum salinities were approximately 4.5 to 5 ppt. The changes in minimum salinities along the south shore were approximately 0.5 ppt increase in the lower portion of the middle of Mill Cove (sta MCE and MCG) and 3 ppt increase toward the upper portion (sta MCJ). Along the north shore essentially no change occurred toward the lower portion (sta MCF) and an approximately 1.5 ppt increase occurred in the middle (sta MCH) and toward the upper portion (sta MCK).

89. The changes in average, maximum, and minimum salinity along the south shore in the upper portion of Mill Cove (sta MCL) caused by plan 15 were approximately 1 ppt increase, 1.5 ppt increase, and 1 ppt decrease, respectively. Along the upper portion of the north shore (sta MCN) changes in average, maximum, and minimum salinities were approximately 2.5 ppt increase, 4.5 ppt increase, and 0.5 ppt decrease.

90. The distribution of the changes in salinities in Mill Cove due to plan 20 was considerably more uniform (particularly between the north and south sides) than that for plans 15 and 18. Along the south shore in the middle of Mill Cove (sta MCE, MCG, MCJ) increases averaged slightly less than 2 ppt. Along the north shore in the middle portion of Mill Cove (sta MCF, MCH, MCK) increases in salinity averaged slightly greater than 2 ppt. The increases in maximum salinity along the middle portion of the south shore (sta MCE, MCG, and MCJ) were approximately 3-4 ppt. Comparable changes along the north shore (sta MCF, MCH, and MCK) were approximately 2.5-4 ppt. Changes in the middle portion of Mill Cove along the south shore for minimum salinities were increased approximately 0.5 ppt at sta MCE and MCG and 2.5 ppt at sta MCJ. Along the north shore comparable locations (sta MCF, MCH, and MCK) were increased between 0.5 and 1 ppt. Changes for average, maximum, and minimum salinities along the upper end of the south shore (sta MCL) were approximately 0.5 ppt increase, 1.5 ppt increase, and 2 ppt decrease,

respectively. Changes for average, maximum, and minimum salinities along the upper end of the north shore (sta MCN) were approximately 2 ppt increase, 3 ppt increase, and 2.5 ppt decrease.

91. In summary, each of the plans resulted in a distinct trend for slight salinity increase in the navigation channel near the lower entrance to Mill Cove relative to other portions of the navigation channel. A trend for slightly reduced salinity occurred with each plan near the upper entrance and above the upper entrance in the navigation channel. Each plan resulted in increases in salinity levels in Mill Cove. Plan 18 resulted in the largest average increase in cove salinities with the north shore incurring a higher increase than the south shore. Plan 15 caused less increase in the average salinity with the north shore also incurring a higher increase relative to the south. Plan 20 caused the least increase in average salinities with a significantly more uniform increase throughout Mill Cove.

Dye Dispersion

92. The effects of plans 15, 18, and 20 on high- and low-water slack (slack currents following flood and ebb phases of the tide, respectively) dye concentrations throughout the model over the 16-cycle test period resulting from dye released throughout the same 16 cycles in Mill Cove and at Mathews Bridge are shown in Plates 53-257. Data used to construct the above plates are also shown in tabular form in Tables 4 and 5, Mill Cove release (sta MCJ) and Mathews Bridge release (just upstream of sta 21B), respectively. Dye concentrations averaged over the 16-cycle test period and used in the preparation of subsequent figures in this section are presented in Table 6.

Mill Cove release

93. Effects in navigation channel. Figure 35 shows the effects of the above three plans on high-water-slack dye concentrations along the navigation channel. These values were obtained by averaging surface and bottom data over the entire 16-cycle test period at stations located along the center line of the navigation channel. All the data are

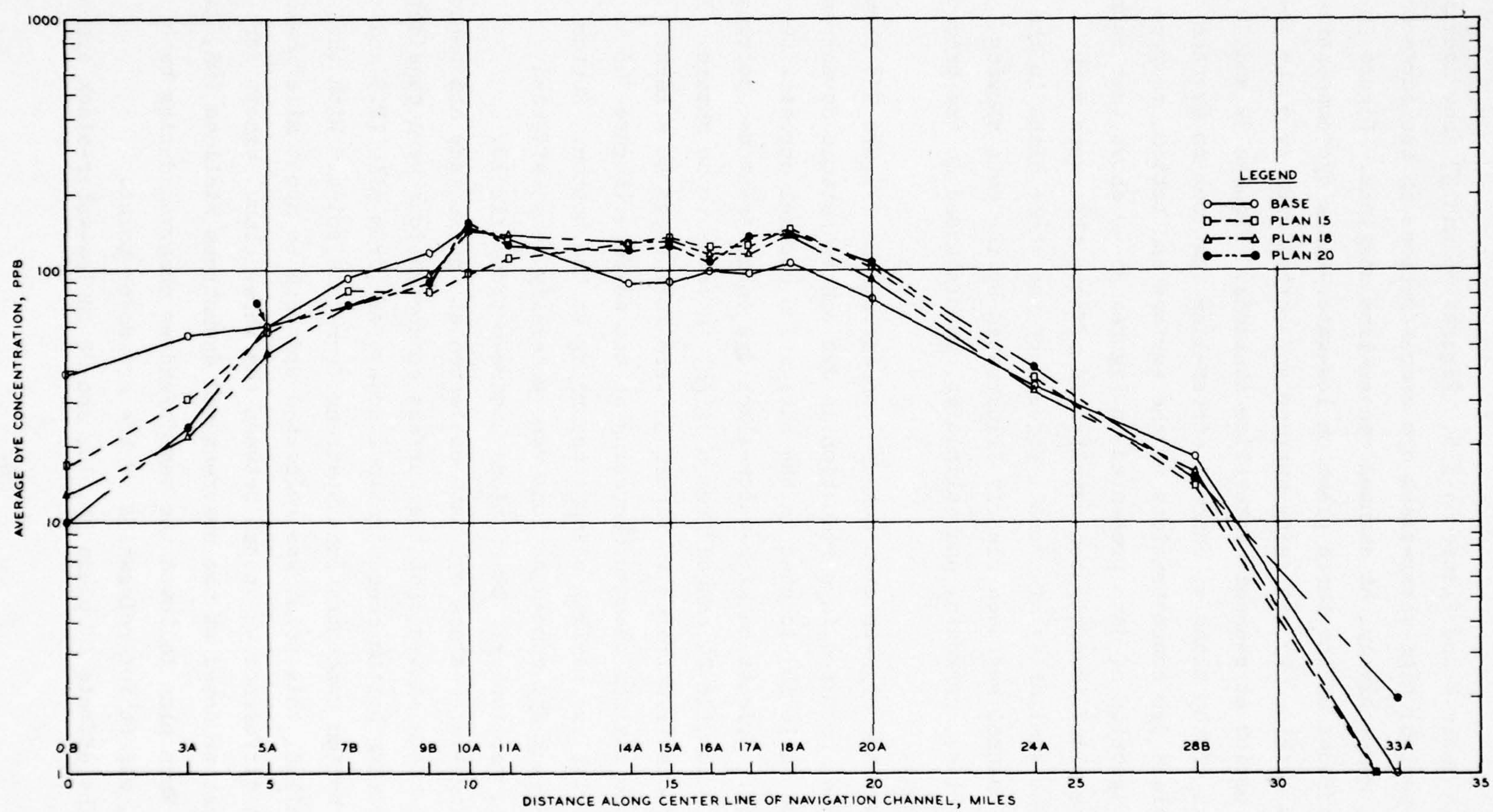

Figure 35. Mill Cove release, high-water-slack dye concentrations; average of surface and bottom depths, center-line channel stations

presented in Table 4 and Plates 54-155. Figures 36 and 37 show average (over test period) high-water-slack dye concentrations at the surface and bottom, respectively, at channel center-line stations. Figure 38 shows the effects of the three plans on low-water-slack dye concentration values obtained by averaging surface and bottom data over the 16-cycle test period at channel center-line stations. Figures 39 and 40 show effects of the plans at channel center-line stations on average low-water-slack dye concentrations at the surface and bottom, respectively. Inspection of data presented in Figures 35-40 shows that each of the three plans investigated resulted in effects that were very similar. The similarity of overall effects by the three plans in the navigation channel has been clearly illustrated by the data showing effects on tides, currents, and salinities, as discussed in the preceding paragraphs.

94. Average high-water-slack dye concentrations (Figure 35) shows that each plan resulted in a reduction in dye concentrations downstream from sta 10A (mile 10) located in the navigation channel opposite the weir opening. Effects on high-water-slack dye concentrations upstream from mile 10 to mile 24 ranged from a slight increase to no change. The overall effects illustrated in Figure 35 were influenced to a large degree by the maximum changes occurring at the surface (Figure 36) in comparison with the minimal changes occurring at the bottom. Bottom high-water-slack dye concentrations were generally least affected (Figure 37), particularly at stations upstream from mile 10.

95. High-water-slack dye data collected at the surface and bottom during base tests showed that the surface concentrations were considerably higher than bottom concentrations downstream from mile 12.5 and lower than bottom concentrations upstream from this point. With the plans installed, this point was relocated upstream to about mile 16-18. Very little difference was noted between the three plans, except for the data scatter noted at the upstream and downstream stations (0B, 3A, and 33A). Each plan followed the same trend as observed during base conditions, except for relocation of the crossover point.

96. The effects of plans 15, 18, and 20 on low-water-slack average

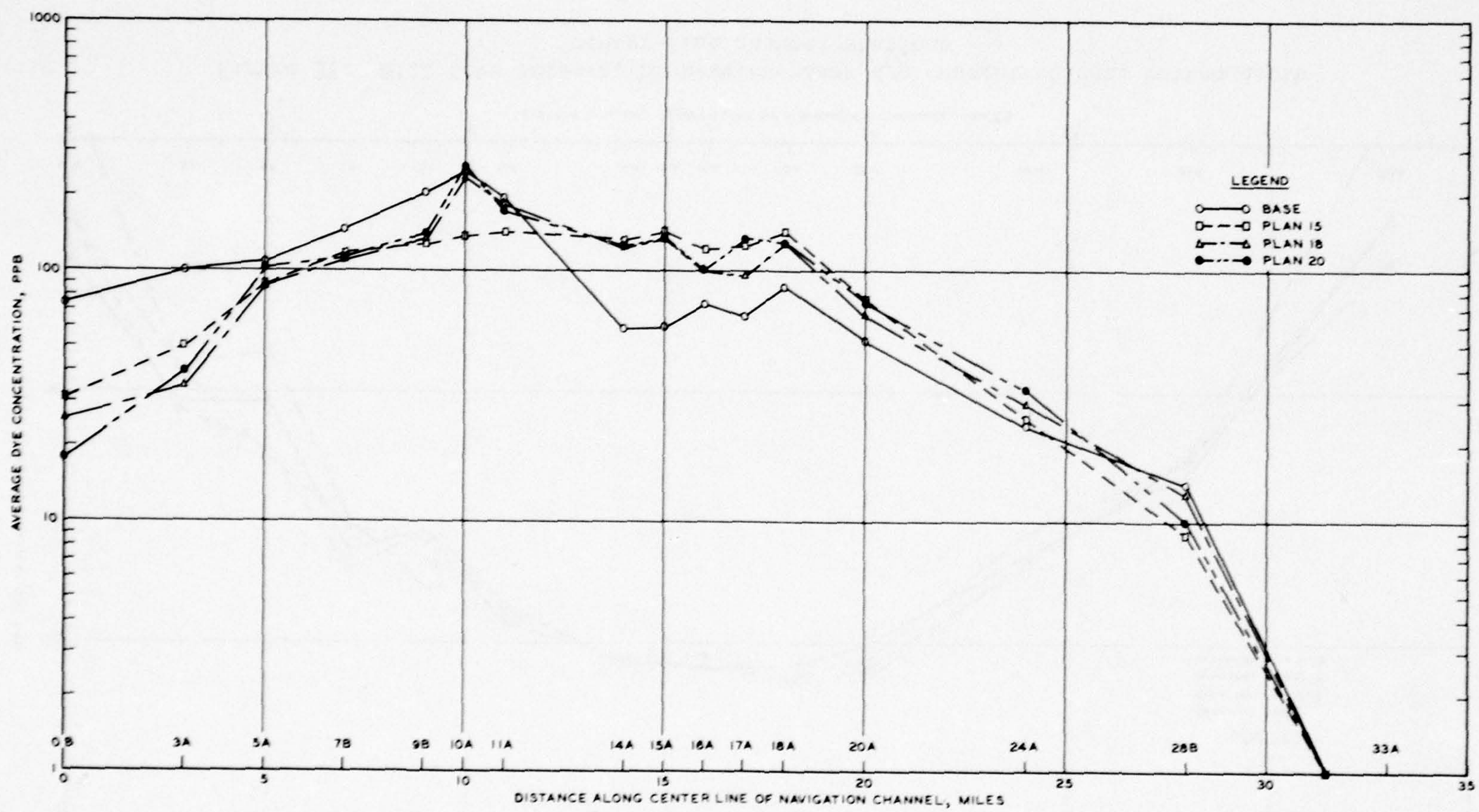

Figure 36. Mill Cove release, high-water-slack dye concentrations; surface depth center-line channel stations

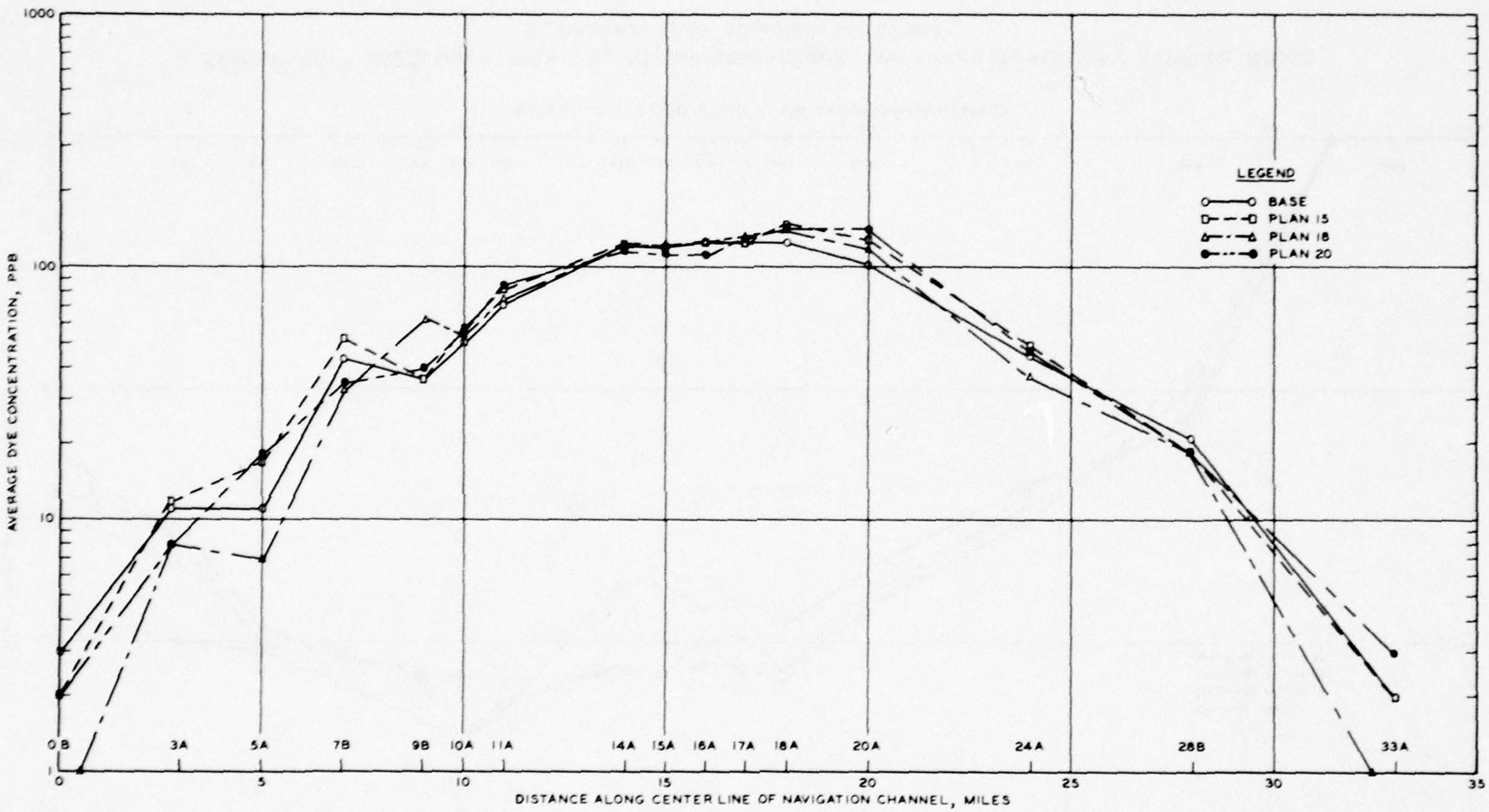

Figure 37. Mill Cove release, high-water-slack dye concentrations; bottom depth center-line channel stations

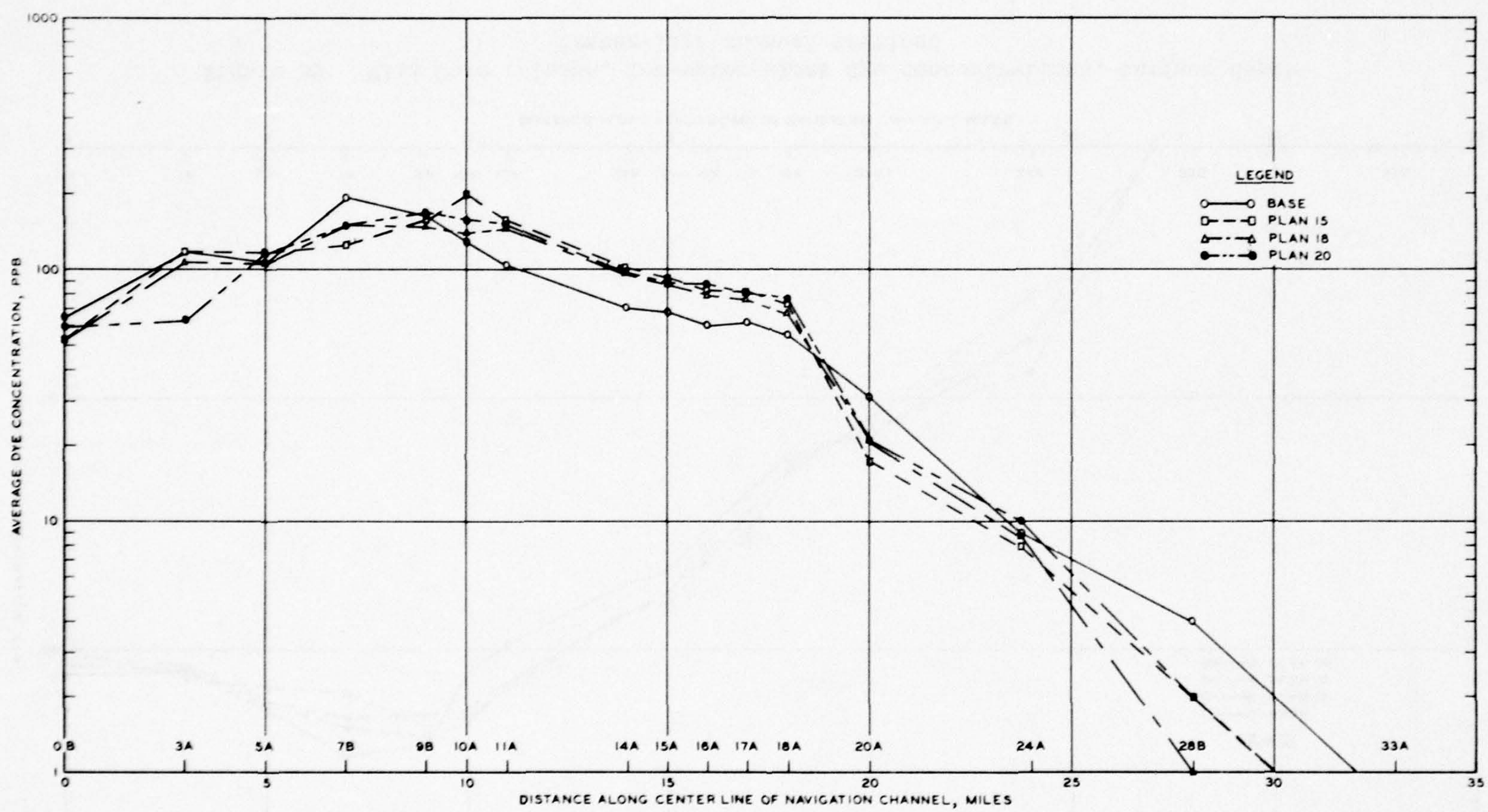

Figure 38. Mill Cove release, low-water-slack dye concentrations; average of surface and bottom depths, center-line channel stations

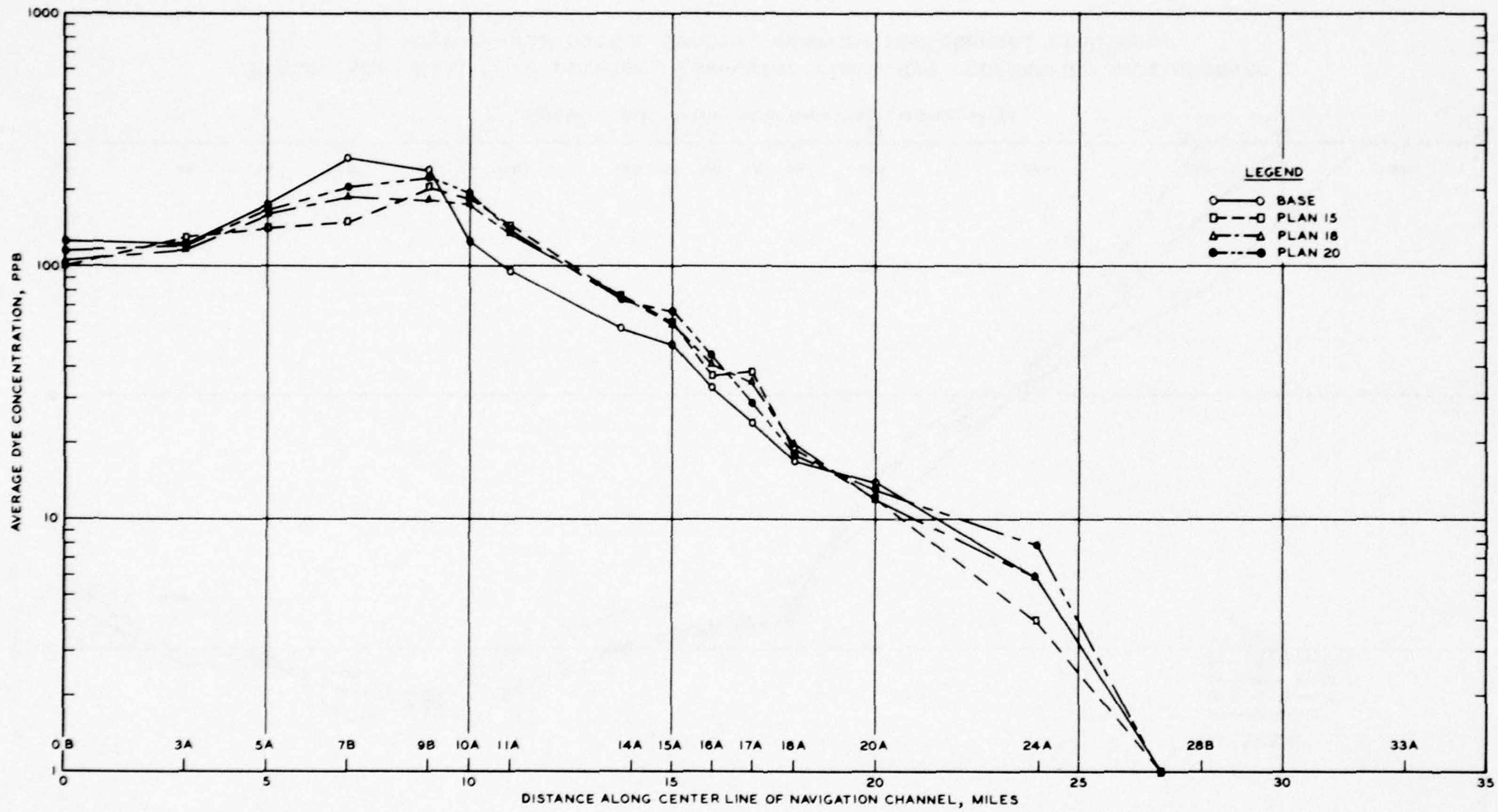

Figure 39. Mill Cove release, low-water-slack dye concentrations, surface depth center-line channel stations

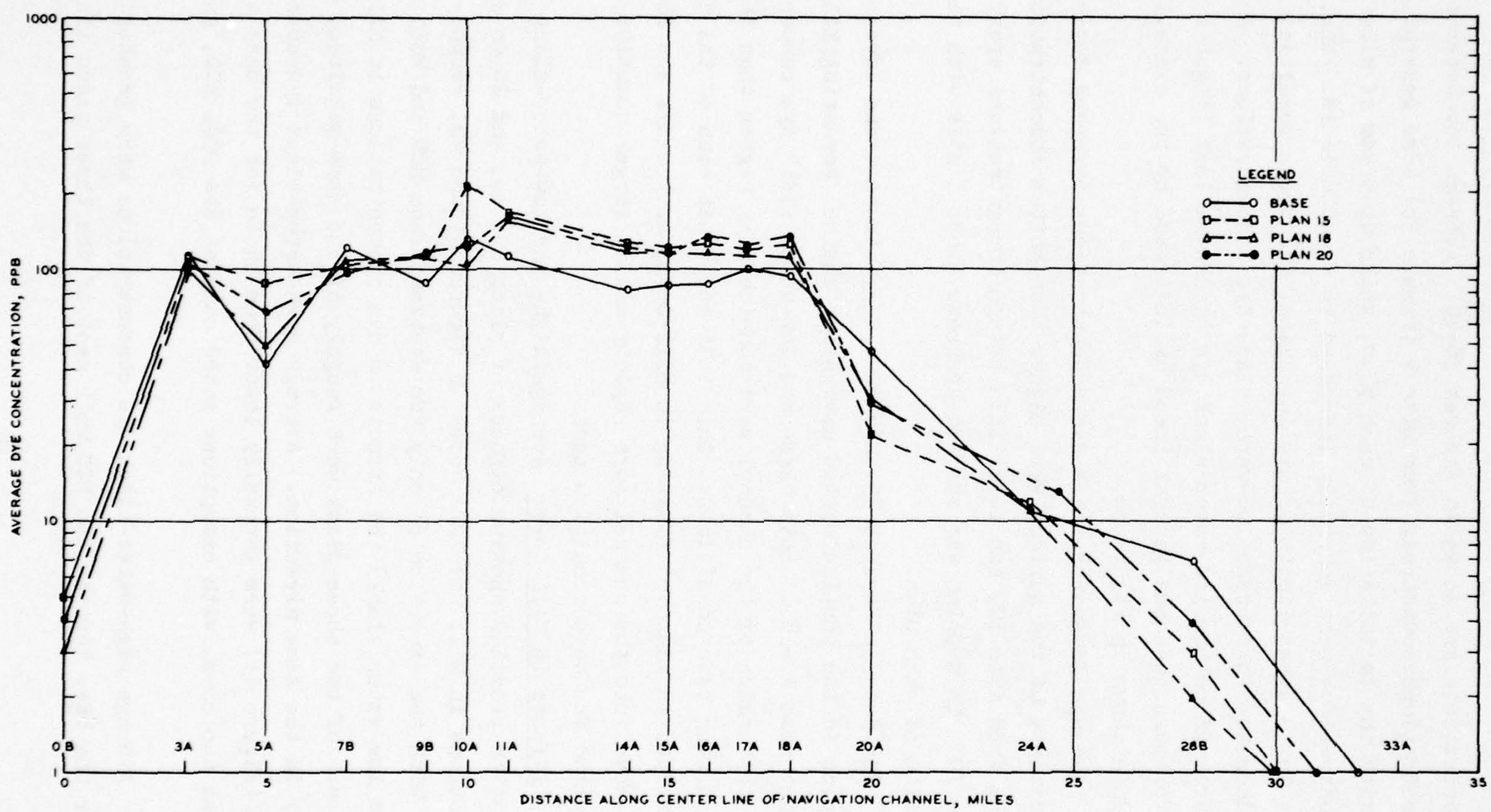

Figure 40. Mill Cove release, low-water-slack dye concentrations; bottom depth center-line channel stations

dye concentrations are shown in Figures 38-40. Average low-water-slack dye concentrations downstream from mile 9 (Figure 38) were generally reduced with the installation of each plan, while upstream of mile 9 dye concentrations were generally increased to about mile 18. Upstream from mile 19 to upper limits of dye intrusion, the plans resulted in a general decrease in average low-water-slack dye concentrations. Both the surface and bottom low-water-slack dye concentrations (Figures 38 and 40) followed the same general trend as indicated by the overall average data shown in Figure 38.

97. Average low-water-slack dye concentrations observed during base conditions at the surface were higher than bottom concentrations downstream from mile 10, and lower than bottom concentrations upstream from mile 10. This point was shifted upstream about 1 mile with the installation of each plan.

98. The data in Figures 35-40 show a very strong trend developed by each plan in the portion of the navigation channel bordering Mill Cove (about mile 10-18). Both high- and low-water-slack dye concentrations in this reach of the channel were considerably higher than those observed during base conditions. This indicates that each of the three plans resulted in improved flushing in Mill Cove, as the dye was flushed from the cove into the channel more rapidly and in larger quantities than occurred for base condition tests.

99. Effects in Mill Cove. Average high- and low-water-slack dye concentration profiles showing effects of plans 15, 18, and 20 on dye concentrations in Mill Cove are shown in Figures 41 and 42, respectively. With the exception of only two stations (sta MCD and MCE, at high- and low-water slack) the effects on dye concentrations in Mill Cove by each of the three plans were roughly of the same magnitude and generally in the same direction. Average high-water-slack dye concentrations (Figure 41) were generally lower than those for the base test throughout the cove, with exceptions noted only at sta MCC, MCD, and MCL.

100. Average high-water-slack dye concentrations were greater than those for the base test at sta MCC with each of the three plans installed.

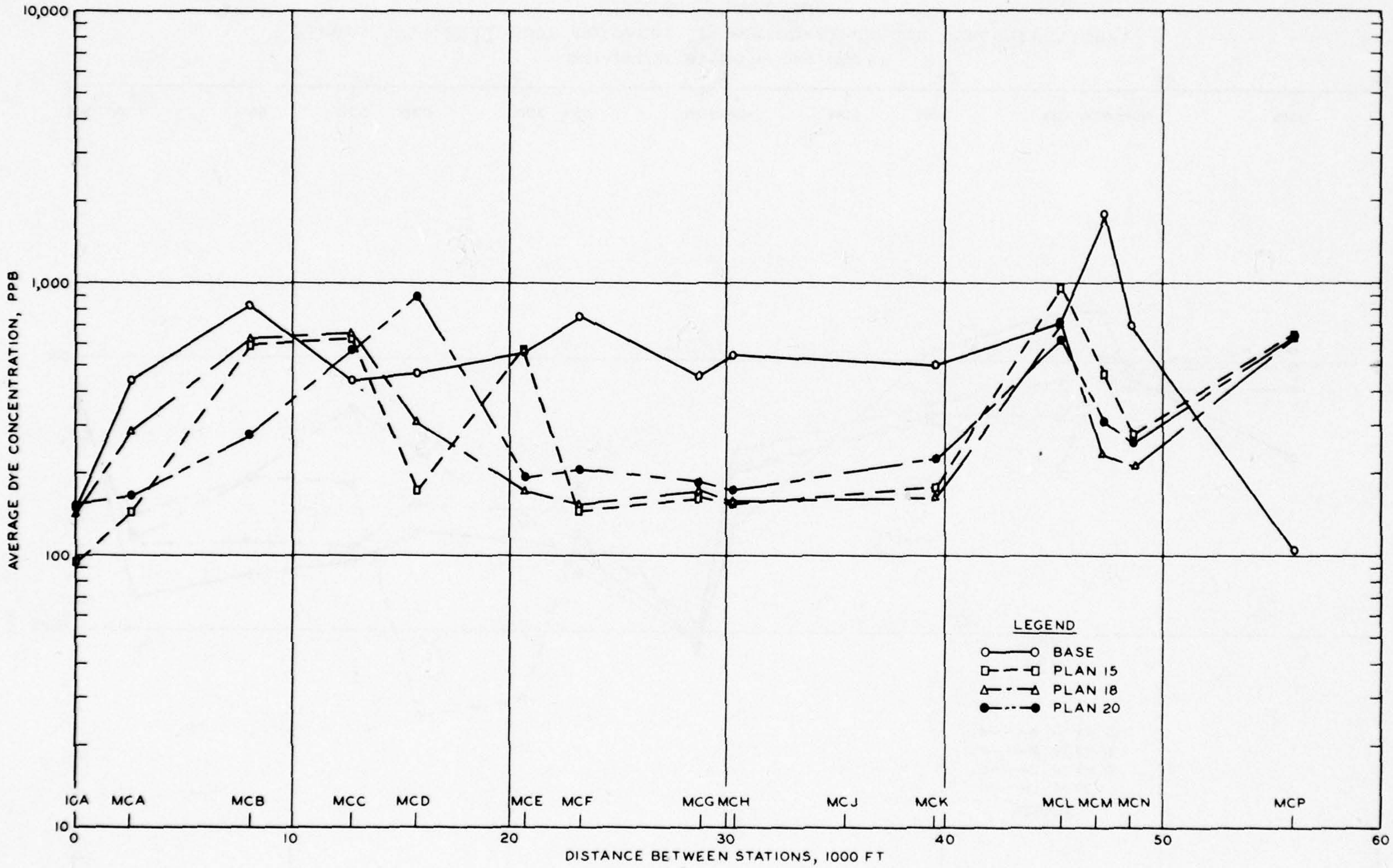

Figure 41. Mill Cove release, high-water-slack dye concentrations, Mill Cove stations

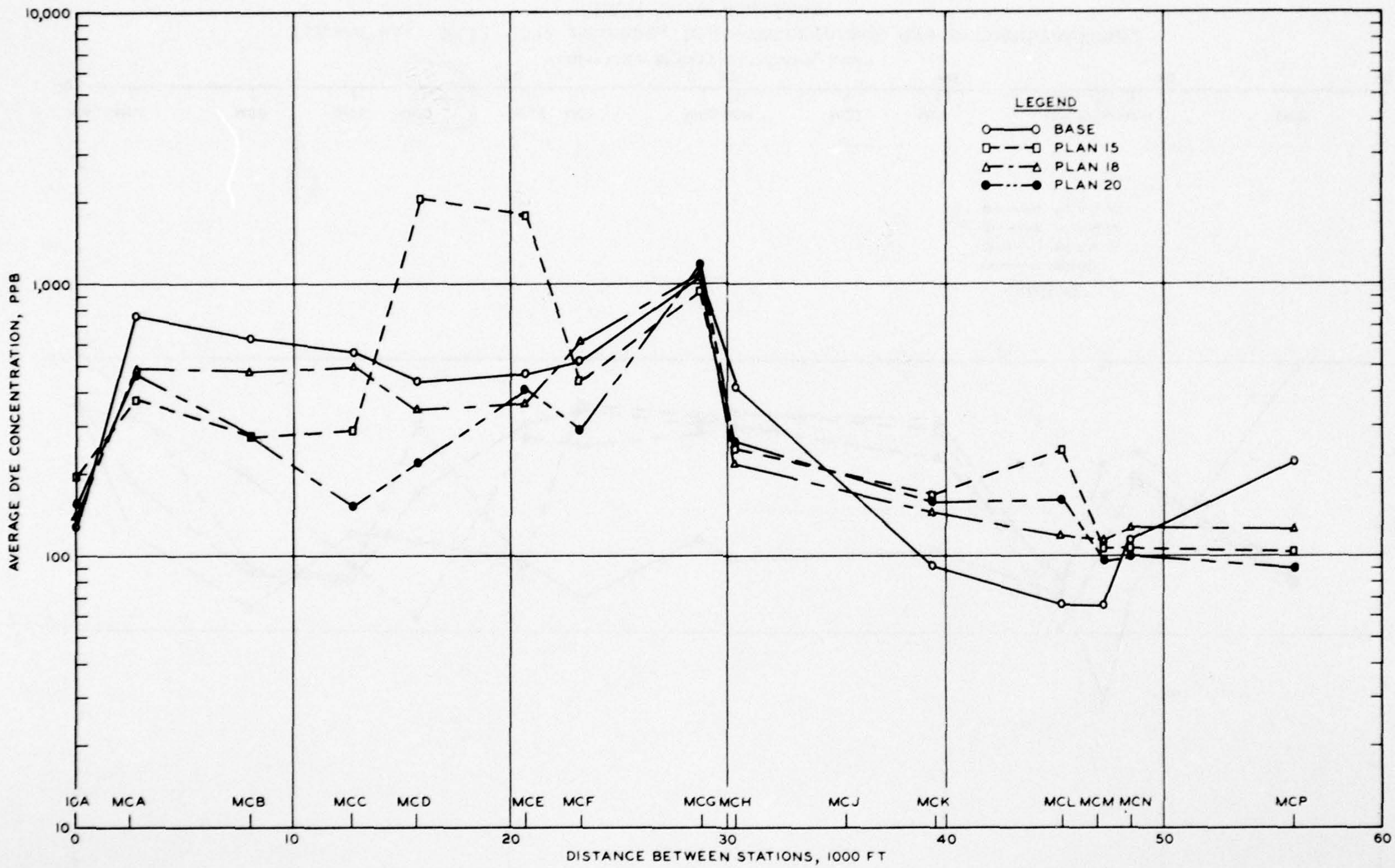

Figure 42. Mill Cove release, low-water-slack dye concentrations, Mill Cove stations

This was due primarily to the station location which during base conditions was in an area of extremely poor circulation and consequently did not receive dye to any significant degree. With the plans installed, this station was not in the mainstream of flow, but tidal exchange was improved in that more dye (water containing larger dye concentrations) was actually now available to this location. Average dye concentrations at sta MCD were increased with plan 20 installed only; plans 15 and 18 decreased dye concentrations at this point. During base tests the mainstream of flow (water containing high dye concentrations) passed between sta MCD and MCF. With the installation of plan 20 (extension of Quarantine Island into Mill Cove) sta MCD was now located in the mainstream of flow and therefore received water containing much higher dye concentrations. Dye concentrations observed at sta MCL, located upstream from the release point, were higher than those for the base test with plan 15 installed, while plans 18 and 20 resulted in lower dye concentrations. However, dye concentrations observed at this point during base conditions and the three plans were about equal and are considered to be extremely close to the limits of accuracy in repeating identical model tests of this type. The small differences could be attributed to the very small change in flow pattern around and through the group of islands located upstream from the injection point.

101. The high-water-slack average dye concentrations at sta MCP, located between Reddie Point and the disposal island, were much greater than those for the base test for each of the three plans. This was due to the increased flood current through the wider opening and a source of water containing higher concentrations of dye. During the base test, the main dye mass was moved into the main navigation channel through the opening between the disposal island and the northwest end of Quarantine Island. During each of the plan tests, the dye mass was routed almost directly over sta MCP.

102. High-water-slack dye concentrations in Mill Cove were decreased the maximum amount in the central portion of the cove. In general, flushing throughout all areas of the cove was greatly improved with the installation of each plan; however, the east end of the cove

(sta MCB and MCC) continued to be the worst area in respect to flushing. Plan 20 was the most effective plan investigated in respect to improved flushing in the east end of Mill Cove (sta MCB, MCC, and MCD). Generally, the high-water-slack arrival time of dye at the various locations in Mill Cove was earlier than arrival times with base conditions.

103. The effects of the plans on average low-water-slack dye concentrations in Mill Cove are summarized in Figure 42. The general effect was decreased dye concentrations in the eastern half of the cove and at the extreme western end (sta MCP). In most of the western portion of the cove, the plans increased dye concentrations. Again, each plan resulted in generally the same overall effects; however, there were more exceptions to this general trend noted during low-water sampling than those observed during the high-water sampling period.

104. Generally, each plan resulted in decreased dye concentrations in the eastern half of the cove, with the exceptions of plan 15 at sta MCD and MCE and plan 18 at sta MCF. Average low-water-slack dye concentrations at these latter stations with respective plans installed were higher than those observed during base conditions.

105. The most notable exceptions occurred at sta MCD and MCE with plan 15 installed. During the base tests, the mainstream of ebb flow (water containing high concentrations of dye) passed between sta MCE and MCF, and MCD and MCF. Flow conditions in Mill Cove during base conditions were extremely sluggish and during a falling tide (ebb flow in navigation channel), flow was generally toward the west end of Mill Cove. Because of the extreme low velocities through the cove for base conditions, lateral distribution of flow was weak in the east end and particularly at the above stations. However, with the installation of plan 15 (island inside the weir opening), sta MCE and MCF were now located in the mainstream of ebb flow and therefore received water containing much higher concentrations of dye. Although average low-water-slack dye concentrations were much greater with plan 15 than with the base condition at this location, overall flushing ability was actually improved. Plates 78 and 79, sta MCD and MCE, respectively, show that high concentrations of dye arrived earlier at these points and

remained almost constant at that high level throughout the test period. The maximum concentrations at these two locations were about double those for the base test.

106. The very small increase in average low-water-slack dye concentrations at sta MCF with plan 18 installed is attributed to the more rapid buildup in concentration to the "equilibrium" level. In fact, the equilibrium (maximum) concentration for plan 18 is lower than that for the base test.

107. Again, as noted during high-water-slack sampling periods, plan 20 was the most effective plan investigated in respect to decreasing dye concentrations in the east end of Mill Cove (sta MCB, MCC, and MCD).

108. Average low-water-slack dye concentrations in the western half of Mill Cove were generally higher than those for the base test, with the exception of sta MCP. Sta MCN was slightly lower than those for the base test with plans 15 and 20 installed. During base test conditions, a large part of the dye was carried out into the navigation channel during flood tide through the wide opening between the disposal island and the western end of Quarantine Island. At times of high-water-slack sampling in Mill Cove at the above locations, currents in the navigation channel were in the ebb direction and continued in that direction for several hours after high-water slack in Mill Cove. These channel currents therefore distributed the greater majority of the dye in the downstream reaches of the estuary. During the following low-water-slack sampling period in Mill Cove, this mass of dye was well mixed in the main navigation channel and did not reenter Mill Cove in strong concentrations. During each of the plan tests, the dye cloud or mainstream of dye mass was routed into the navigation channel through the opening between Reddie Point and the disposal island, almost directly over sta MCP. The large differences in high-water-slack concentrations between base and plan tests at sta MCP (Figure 41) illustrate this condition very well. At the following low-water-slack sampling period, this dye mass was diverted into Mill Cove again through the opening between Reddie Point and the disposal island in rather strong

concentrations; thus at the next low-water sampling period with the plans installed dye observations were much stronger than those observed during base tests. Low-water-slack dye concentrations at sta MCP with the plans installed were lower than those observed for base conditions because at the time of sampling, the dye mass had been flushed pass this point farther downstream into Mill Cove. It should be pointed out at this time that high- and low-water-slack periods occurring in the model and prototype do not necessarily correspond to periods of highest and lowest tide levels. Dye concentration profiles covering the entire test period at sta MCK, MCL, MCM, and MCN shown in Plates 83-86, respectively, show that dye reached these stations earlier and were considerably higher than those for the base test. These profiles more specifically show that even though dye concentrations were higher than those for the base test, they remained more constant at this level throughout the test period than did base dye concentrations. During base tests, lower dye concentrations were observed early in the test, but were increased significantly throughout the remainder of the test. Maximum concentrations at sta MCK, MCL, and MCM were considerably higher for all plans than those for the base test.

109. In general, each of the three plans improved flushing in Mill Cove, with plan 20 having a slight advantage over plans 15 and 18. This advantage was realized more specifically in the east end of Mill Cove, an area of poor flushing and tidal exchange.

Mathews Bridge release

110. Analysis of the results of the Mathews Bridge release dye test must be accomplished from two opposing viewpoints. For sampling stations located in the navigation channel, the dye represents an upstream source of general pollutants. Thus, lower concentrations in the plan tests than those in the base test represent improved conditions. On the other hand, for stations located in Mill Cove, the dye represents an outside source of water of generally better quality than that presently existing in the cove. Thus, higher concentrations in the plan tests than those in the base test represent improved conditions.

111. Effects in the navigation channel. Figure 43 shows the

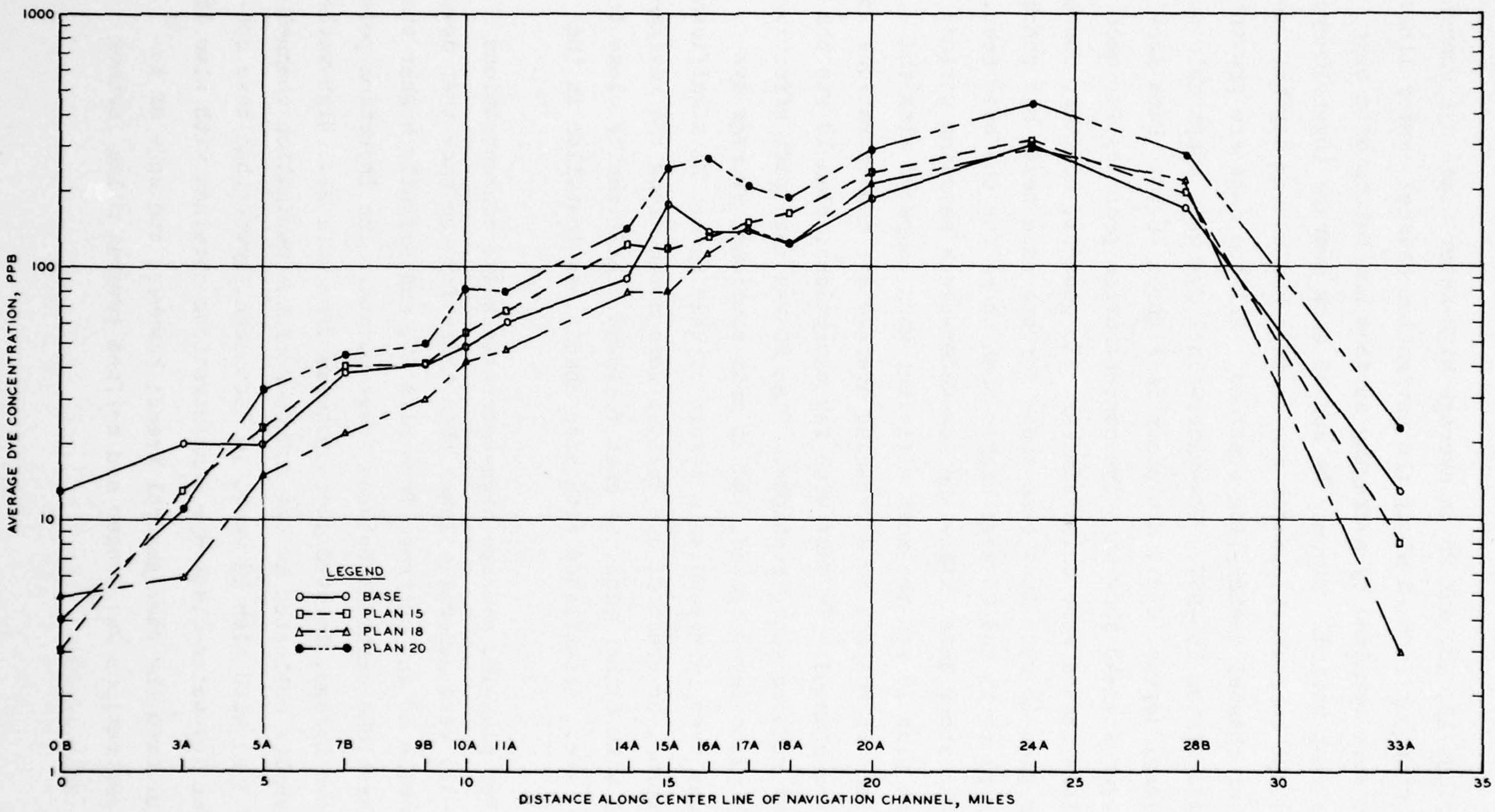

Figure 43. Mathews Bridge release, high-water-slack dye concentrations; average of surface and bottom depths, center-line channel stations

effects of plans 15, 18, and 20 on average high-water-slack dye concentrations at stations located along the navigation channel center line. These values were obtained by averaging surface and bottom data over the 16-cycle test period. Figures 44 and 45 show average (over 16-cycle test period) dye concentrations for the surface and bottom depths, respectively, at channel center-line stations. All the data are presented in Table 5 and Plates 156-257. Low-water-slack dye data comparable to above locations, depths, etc., are shown in Figures 46-48. Data presented in Figures 43-48 show that dye concentration profiles for each of the three plans tested were quite similar. In general, however, concentrations for plan 18 were less than those for the base test, but concentrations for plans 15 and 20 were higher than those for the base test.

112. The above data (high- and low-water-slack sampling period) all show that plan 18 was the most efficient when compared with the other two plans in respect to decreasing average dye concentrations in the navigation channel. In fact with few exceptions, plan 18 was the only one that reduced concentrations. Plan 20 was the least effective of the three plans investigated, and at most stations, average dye concentrations were increased as a result of this plan. No significant trends, patterns, or areas of dye buildup were noted along the navigation channel with either plan, as each followed significantly close to the pattern, etc., established with base conditions installed in the model.

113. For plan 18, average high-water-slack dye concentrations (Figures 43-45) were generally lower than those for the base test downstream from mile 18 and upstream from mile 28, and slightly higher than base concentrations upstream between these points. The injection point was at Mathews Bridge, located just upstream from mile 21. High-water-slack dye samples collected at the extremes of the navigation channel (sta 0B and 33A) with plan 18 were, in each case, lower than base conditions. The low-water-slack dye concentrations obtained with plan 18 installed followed the same general trend; however, the zone of increased concentrations was longer and shifted several miles farther downstream (mile 11-20).

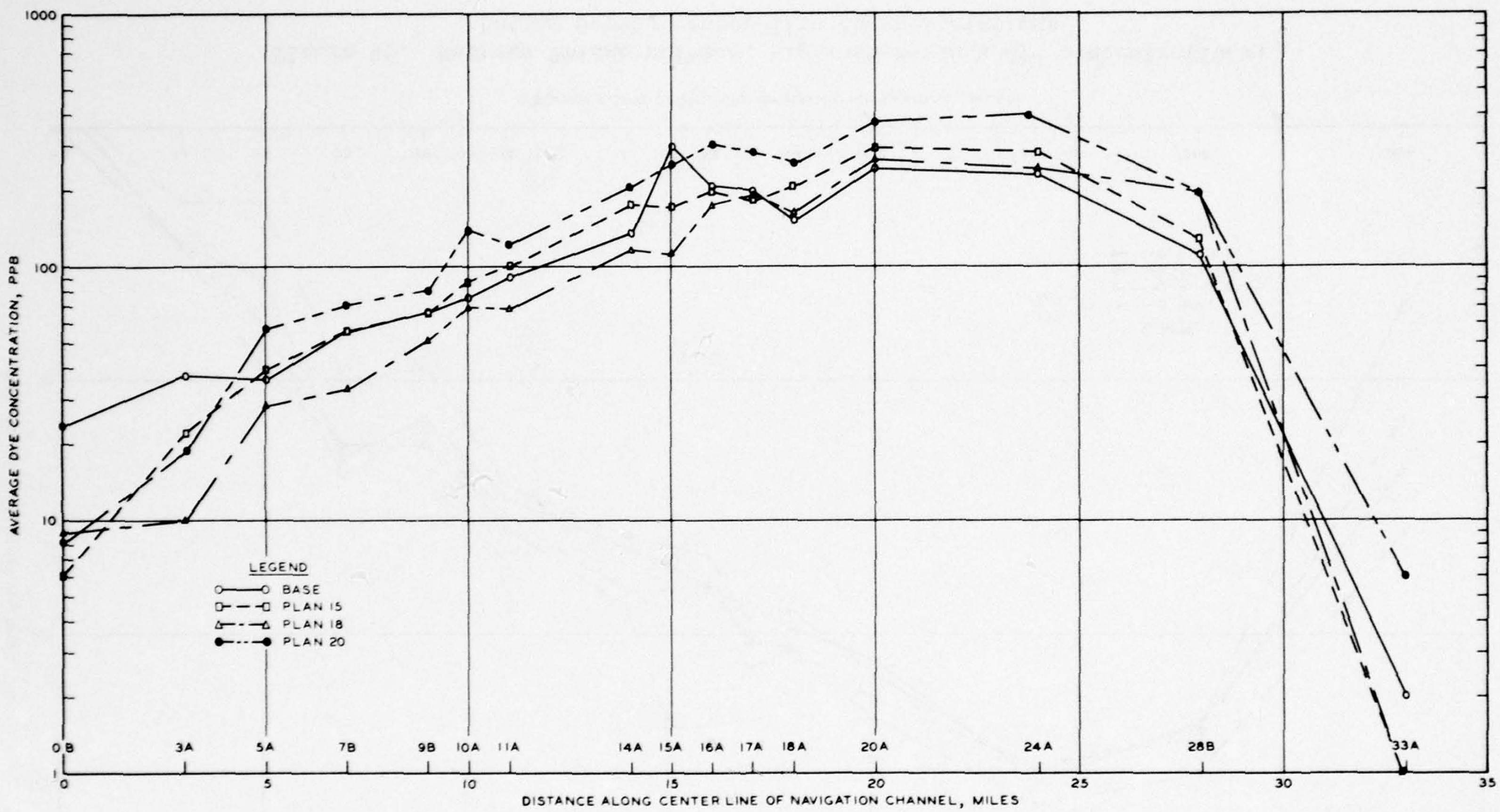

Figure 44. Mathews Bridge release, high-water-slack dye concentrations; surface depth, center-line channel stations

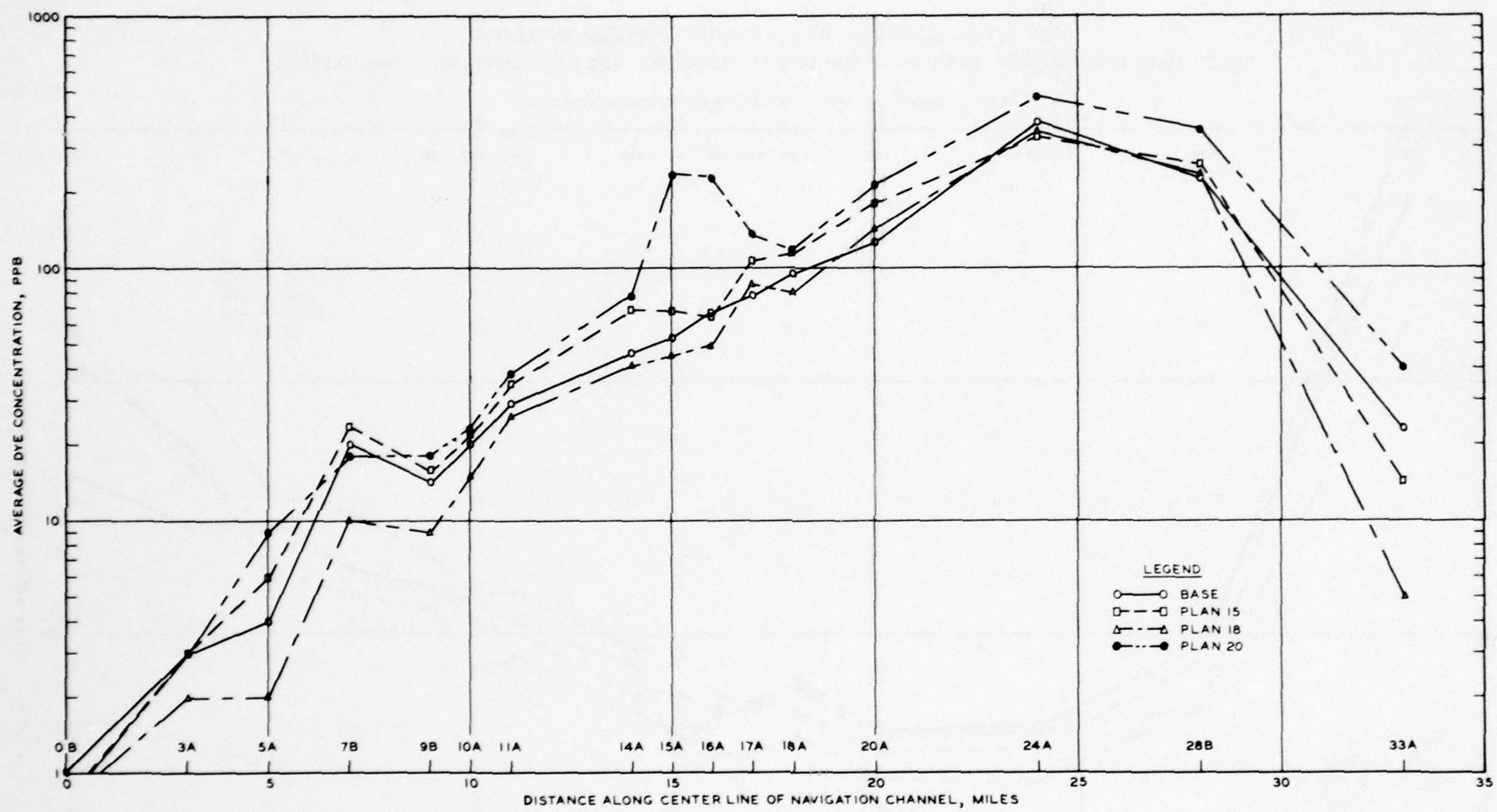

Figure 45. Mathews Bridge release, high-water-slack dye concentrations; bottom depth, center-line channel stations

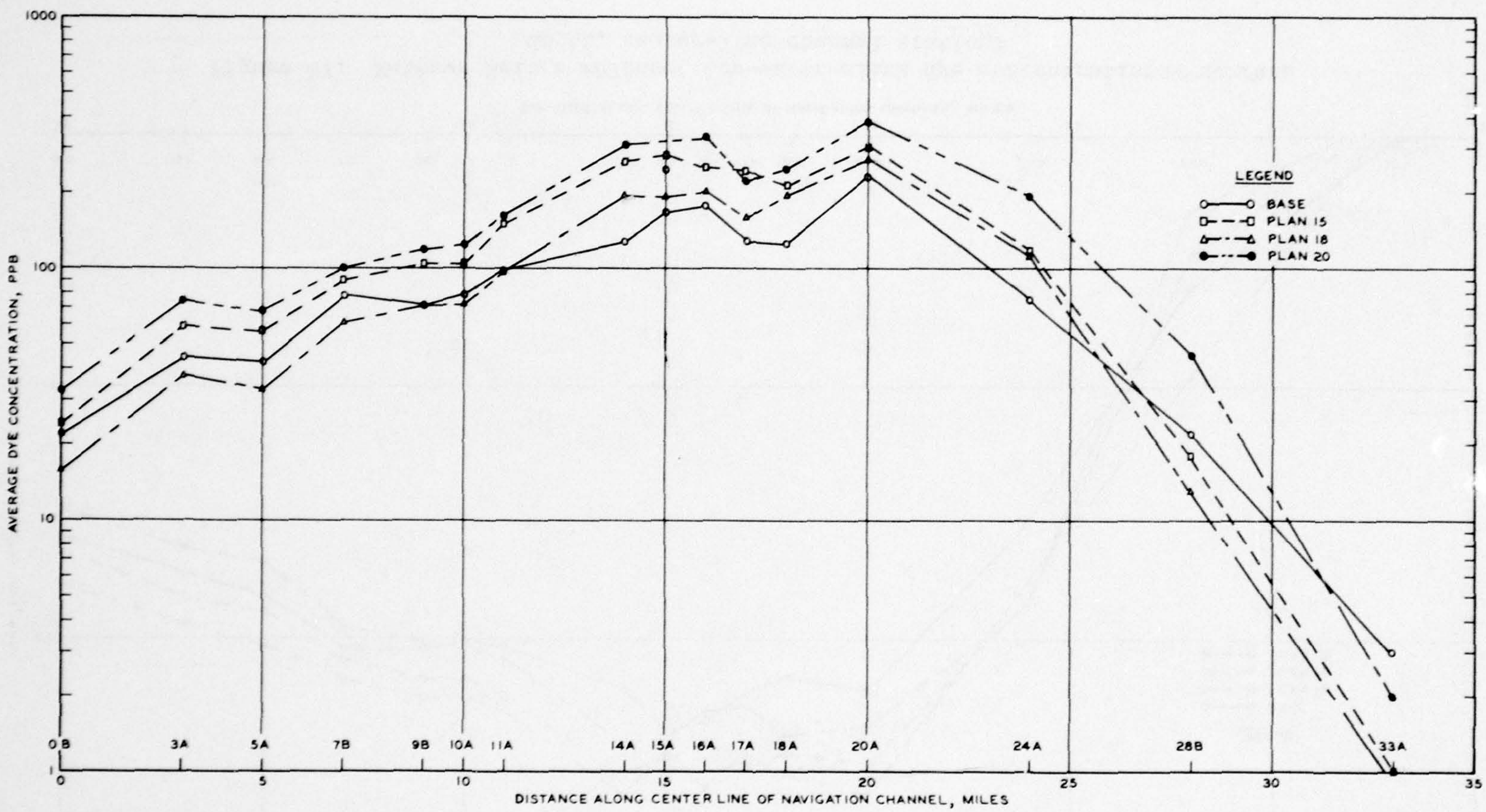

Figure 46. Mathews Bridge release, low-water-slack dye concentrations; average of surface and bottom depths, center-line channel stations

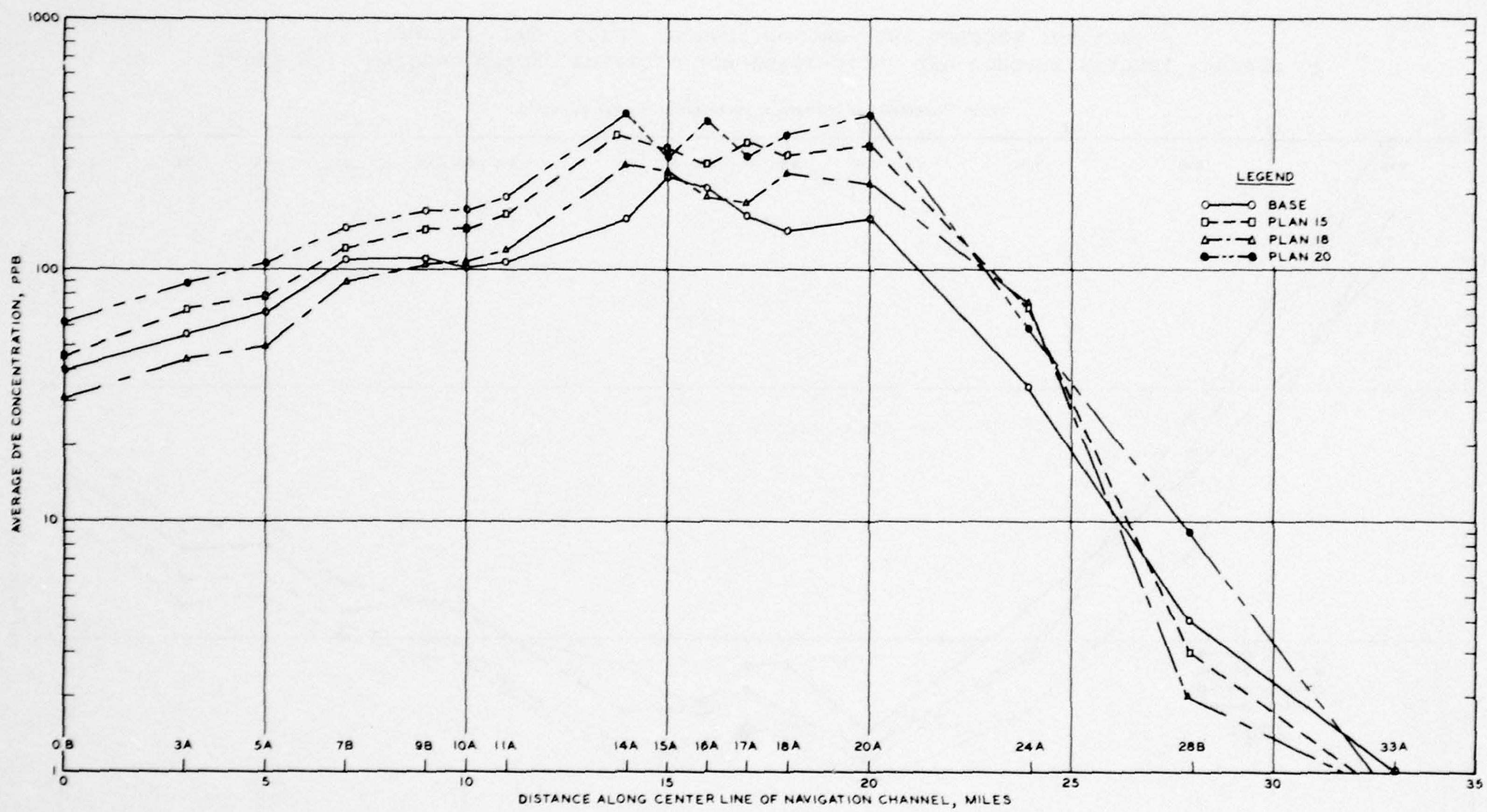

Figure 47. Mathews Bridge release, low-water-slack dye concentrations; surface depth, center-line channel stations

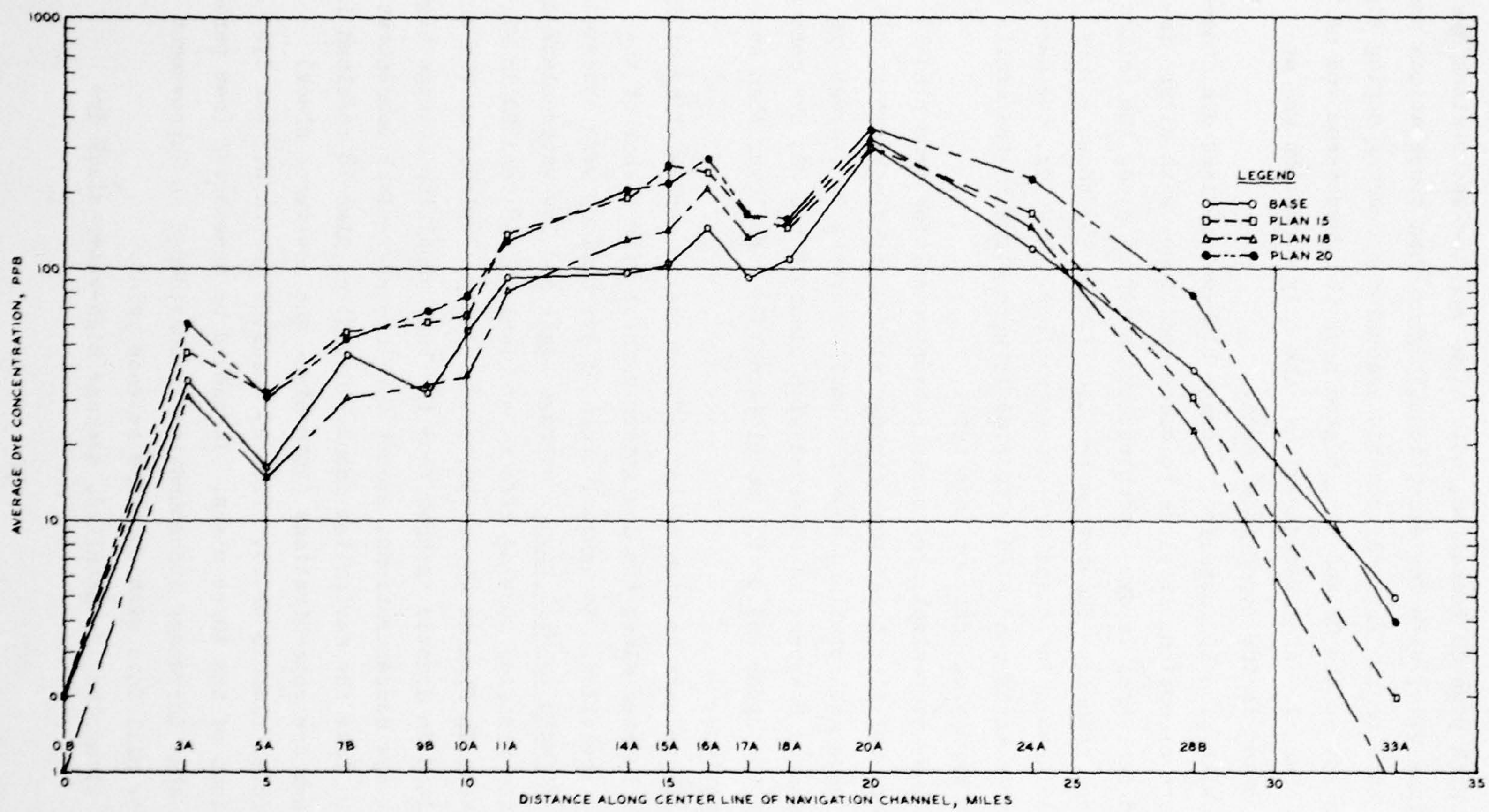

Figure 48. Mathews Bridge release, low-water-slack dye concentrations; bottom depth, center-line channel stations

114. With plan 20 installed, both high- and low-water-slack dye concentrations were, with few exceptions, higher than observations made during the base test. The only notable exception occurring during high-water-slack was at sta OB and 3A, located near the downstream end of the navigation channel. At low-water-slack, the only exception was at sta 33A, located in the upper model area.

115. With plan 15 installed, average high-water-slack dye concentrations were exceptionally close to base conditions, with slight increases and decreases in dye concentrations observed along the entire length of the channel. The bottom profile (Figure 45) shows a very slight trend toward increased dye concentrations. However, the data resulting from tests conducted with plan 15 were close to the limits of accuracy in repeating tests of this type.

116. Low-water-slack dye concentrations resulting from plan 15 showed a more definite trend than average high-water-slack dye results, as in this case most stations showed a small increase in average dye concentrations. However, as observed with plans 18 and 20, dye concentrations at the upper end of the model (sta 33A) were lower than base test observations.

117. There were no significant differences in arrival time of dye at stations located along the navigation channel with either of the three plans installed. No unusual areas of dye buildup were observed.

118. Effects in Mill Cove. Average high- and low-water-slack dye concentration profiles showing effects of plans 15, 18, and 20 in Mill Cove are shown in Figures 49 and 50, respectively. Neither of the three plans resulted in drastic changes from the base condition average high-water-slack dye concentrations, except for low-water-slack concentrations at sta MCB. Like the navigation channel dye data, plan 18 resulted in lower average dye concentrations (both high- and low-water slack) than did either plan 15 or 20. Plan 20 resulted in the highest dye concentrations of the three plans. It should be remembered (see paragraph 110) that increased concentration is considered an improvement in flushing for Mill Cove with this dye release point.

119. With plan 18 installed, average high-water-slack dye

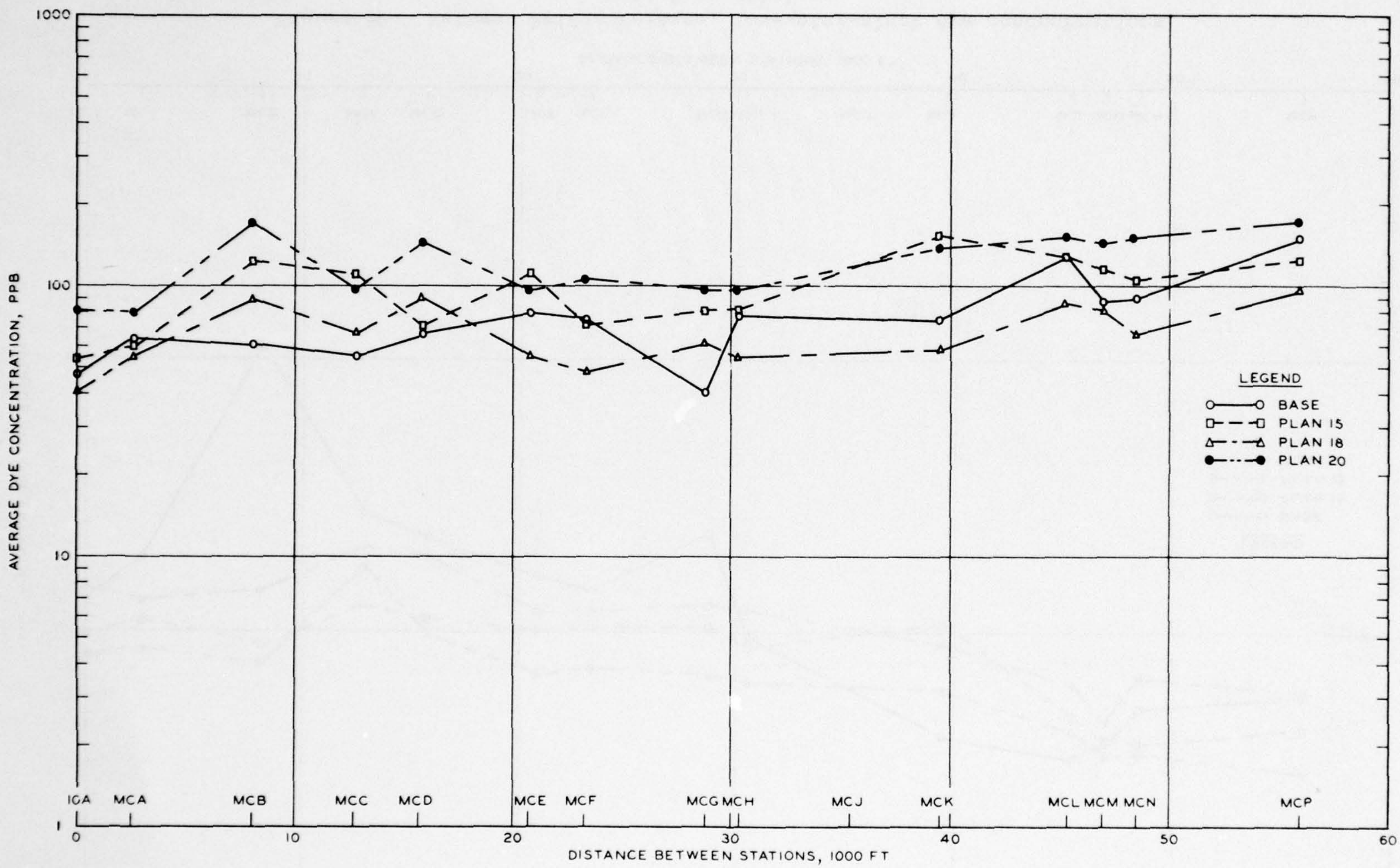

Figure 49. Mathews Bridge release, high-water-slack dye concentrations, Mill Cove stations

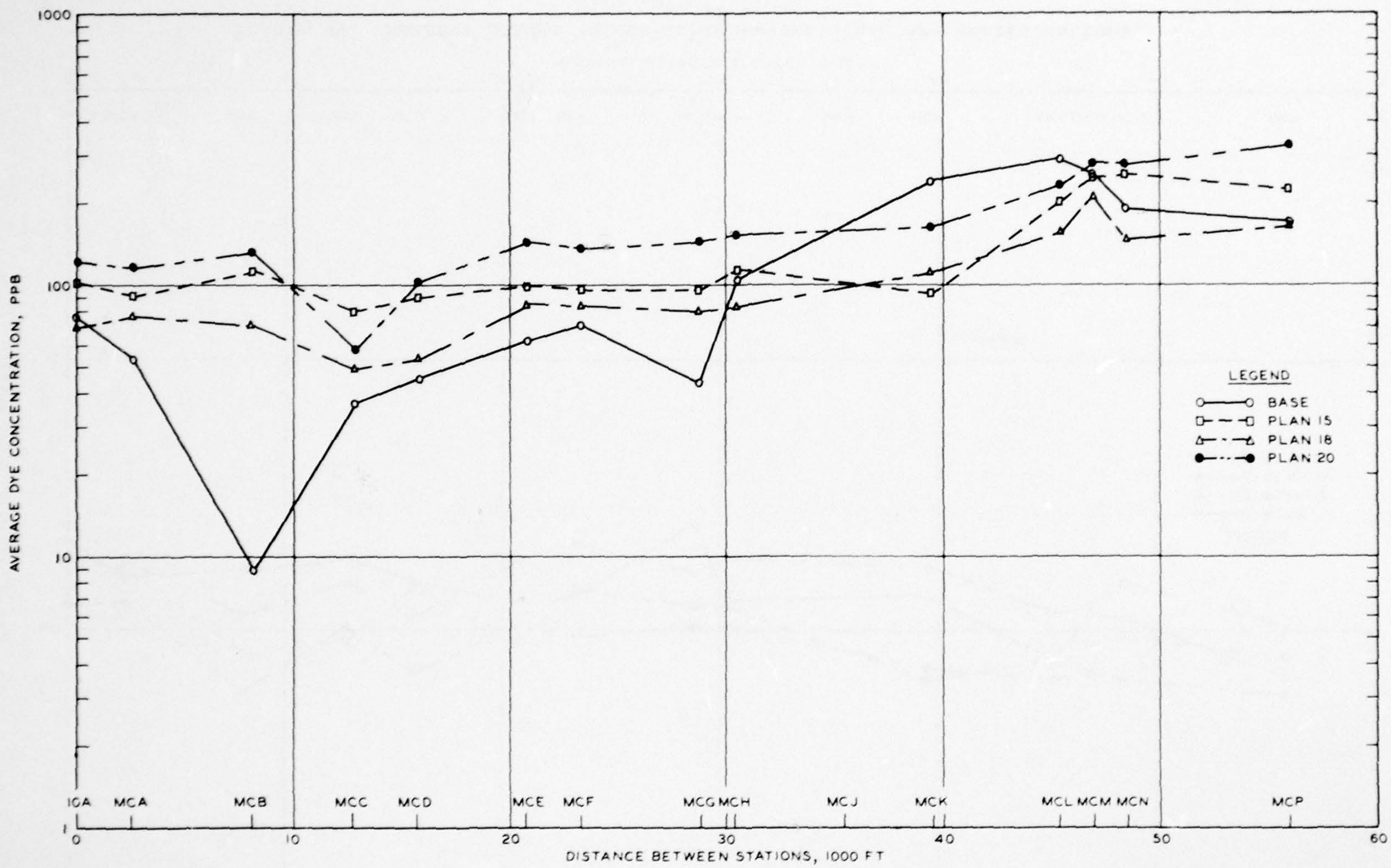

Figure 50. Mathews Bridge release, low-water-slack dye concentrations, Mill Cove stations

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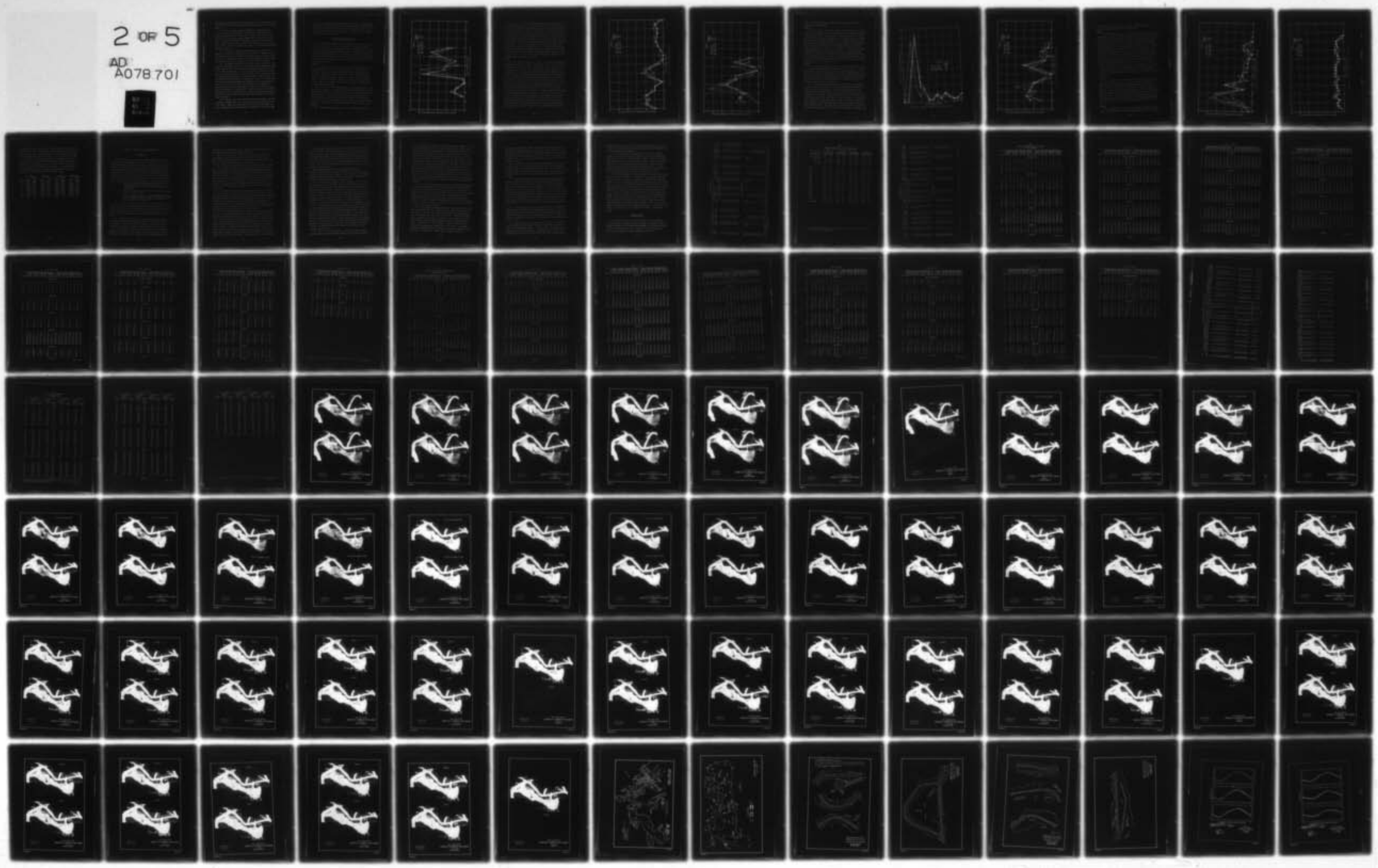


concentrations were generally higher than those for the base test at the east end of Mill Cove (sta MCB, MCC, and MCD, and lower in the remaining areas.

120. Plan 20 average high-water-slack dye concentrations were higher than base concentrations at all stations located in the cove. Average concentrations at sta MCB, MCC, and MCD (east end of the cove) generally were increased a greater amount than in other areas of the cove. This is an indication of improved flushing in this area of the cove. Relatively large increases were also observed at sta MCG, MCK, MCM, and MCN. These four stations are located in the central and western portions of the cove.

121. For plan 15, average high-water-slack dye concentrations either were essentially unchanged or were increased. Generally, plan 15 dye data were very close to being about midway between the plan 18 and plan 20 data. Maximum increases in average high-water-slack dye concentrations for plan 15 were observed at sta MCB, MCC, MCG, and MCK.

122. Low-water-slack average dye concentrations in Mill Cove followed the same general pattern as was observed in the navigation channel during both the high- and low-water-slack sampling periods and in Mill Cove at high-water-slack, i.e., plan 18 resulted in lowest dye concentrations in comparison with the other two plans, while plan 20 resulted in the highest concentrations of the three plans. Plan 15, again, was approximately halfway between the other plans. Each of the three plans resulted in increasing average dye concentrations in the downstream or eastern half of the cove, while concentrations in the upstream or western half of the cove were generally reduced at sta MCK, MCL, and MCM but increased at sta MCN and MCP. Sta MCB, located in the extreme eastern end of the cove, reflected the greatest increase in dye concentrations over those observed during base tests with each of the three plans installed.

123. Overall, each of the above three plans resulted in improved flushing throughout Mill Cove. Plan 20 was the most effective of the three plans. Higher dye concentrations in this test case means that more, relatively clean, upland water was being moved into and through

Mill Cove as a result of the installation of the plans. Generally, dye released at the center line of the navigation channel at Mathews Bridge arrived at stations in Mill Cove earlier during the plan tests than dye released during base test conditions. There were no areas where an unusual buildup of dye occurred.

Navigation Channel Shoaling

124. Channel shoaling tests were conducted for the base test and plans 15, 18, and 20. Results of these tests are shown in Table 7 (channel shoaling index) and in Figures 51-57. Shoaling index is the total amount of material recovered for a plan test divided by the total amount of material recovered for the base test. Model tests were conducted to determine effects of the above three plans on channel shoaling in reaches B-H. The locations of the reaches and individual sections are shown in Plate 26.

Reach B

125. The effects of plans 15, 18, and 20 on shoaling rates and patterns in Reach B (Plate 3) are shown in Table 7 and in Figure 51. These data show that each plan resulted in essentially no change in the rate or pattern of channel shoaling in reach B. Shoaling index values for plans 15, 18, and 20 were 101.5, 102.3, and 105.4, respectively. These data indicate no change in the channel shoaling rates, as each plan was well within the limits of accuracy in repeating model shoaling tests of this type.

126. Each of the three plans resulted in a downstream shift of the peak shoal in section 33 to section 32, while the peak shoal in section 36 was shifted upstream to section 37 by each plan. The location of the minimal shoaling in section 34 was shifted upstream to section 35 for each of the plans. With the exception of a slight shift in shoaling pattern, each of the three plans had minimum effects on channel shoaling in reach B. Changes in shoaling patterns were similar for each plan.

Reach C

127. The effects of plans 15, 18, and 20 on shoaling rates and

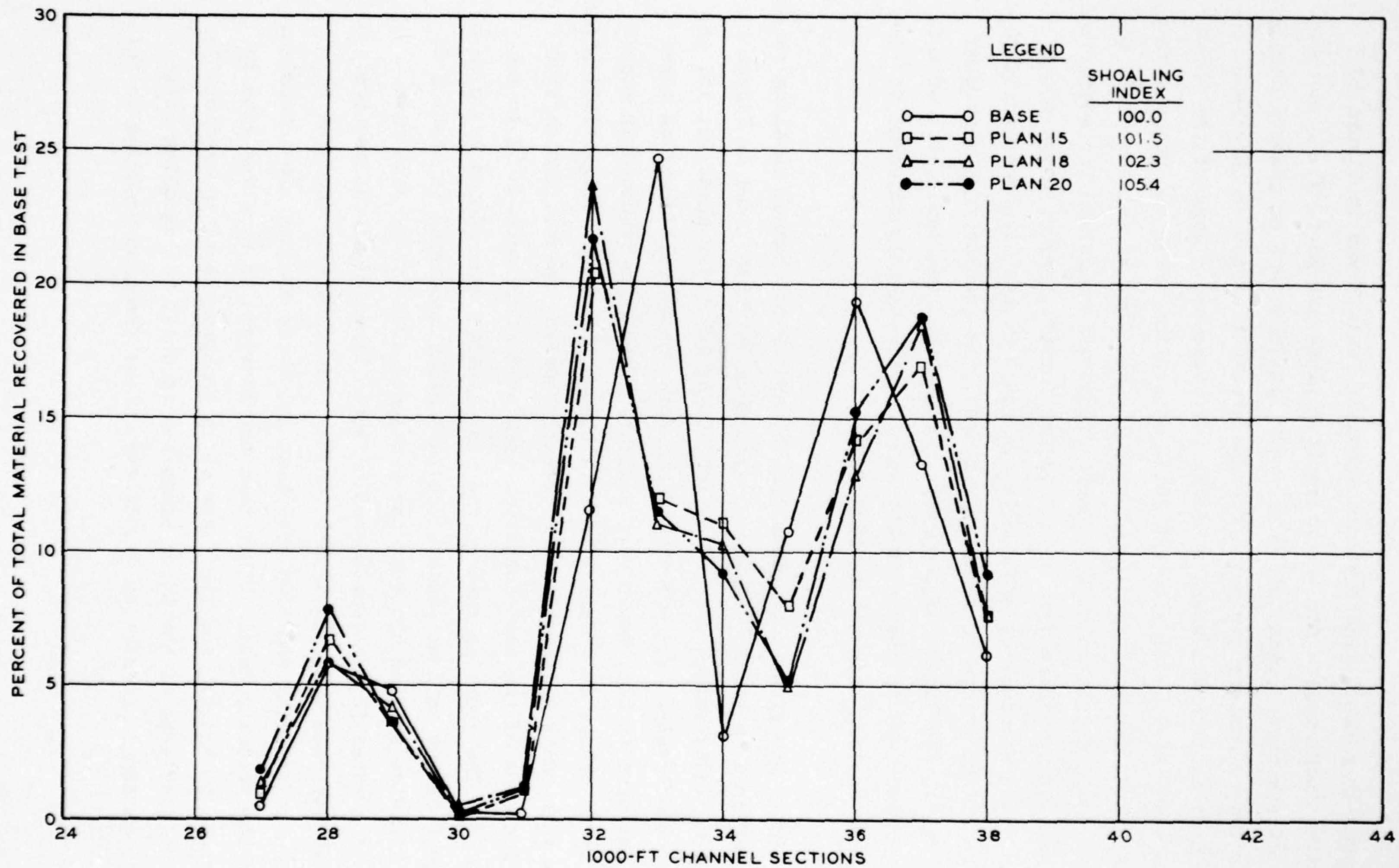


Figure 51. Reach B, shoaling rates and patterns

patterns in reach C (Plate 4) are shown in Table 7 and in Figure 52. Shoaling index values for the respective plans are 93.6, 95.4, and 96.0. Each of the three plans tested had very little effect on channel shoaling rates or patterns in reach C. The greatest effect in this reach occurred at section 47, where shoaling was increased. Each of the three plans resulted in a single peak shoal at section 47 or 48, whereas base tests showed two peak shoals occurring in sections 46 and 48. This increase could result in more frequent dredging to maintain the authorized channel depth. There is a slight indication that any of these plans would cause a reduction of shoaling in reach C; but with the exception of the slight change to shoaling patterns, the results from each plan were within the limits of accuracy in repeating identical tests of this type. There was no change in the sections immediately adjacent to the enlarged eastern entrance to Mill Cove.

Reach D

128. The effects of plans 15, 18, and 20 on channel shoaling rates and patterns in reach D (Plate 5) are shown in Table 7 and in Figure 53. Shoaling index values are 104.6, 104.7, and 105.5 for plans 15, 18, and 20, respectively. The effects of each plan on overall shoaling rates and patterns in this reach were similar. Each plan resulted in essentially no change in shoaling rate (although there is a slight indication of a very small increase in the overall shoaling rates), and shifted the location of the base condition peak shoal from section 63 to section 64. The shoaling rate in the peak section was reduced by 20 to 40 percent by the various plans. The peak shoal occurring in section 68 was likewise shifted upstream one section (1,000 ft) by each plan. Shoaling rates in sections 60 and 61 were increased almost proportionally to the decrease realized in section 63. Since this is the area of change to velocity and flow predominance, these changes are consistent with the velocity data. Other than the increase in shoaling rate in sections 60 and 61, and the decrease in the peak shoal at section 63, the only effects of the three plans was to shift the shoaling pattern upstream about one section (1,000 ft). Less frequent dredging in this

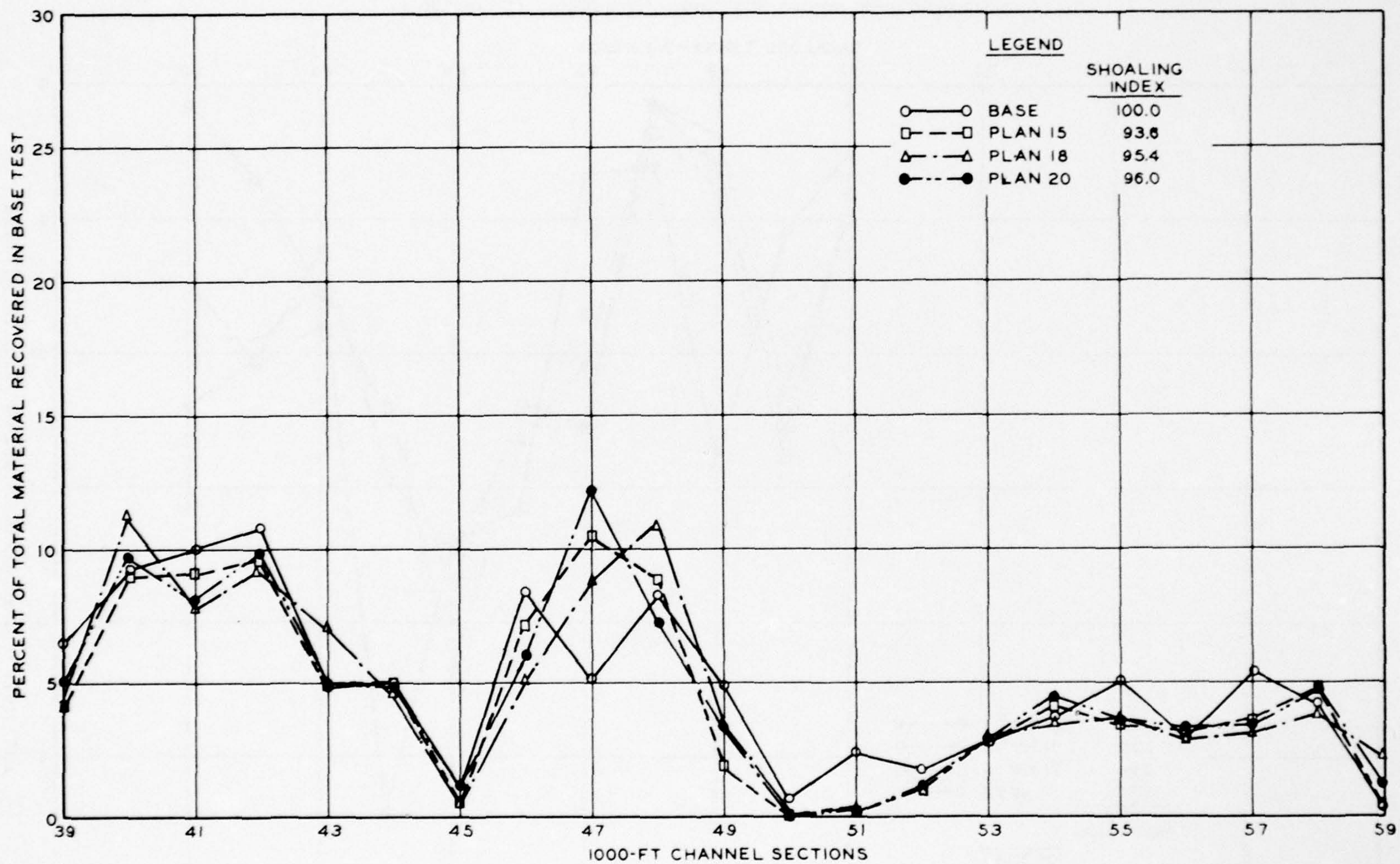


Figure 52. Reach C, shoaling rates and patterns

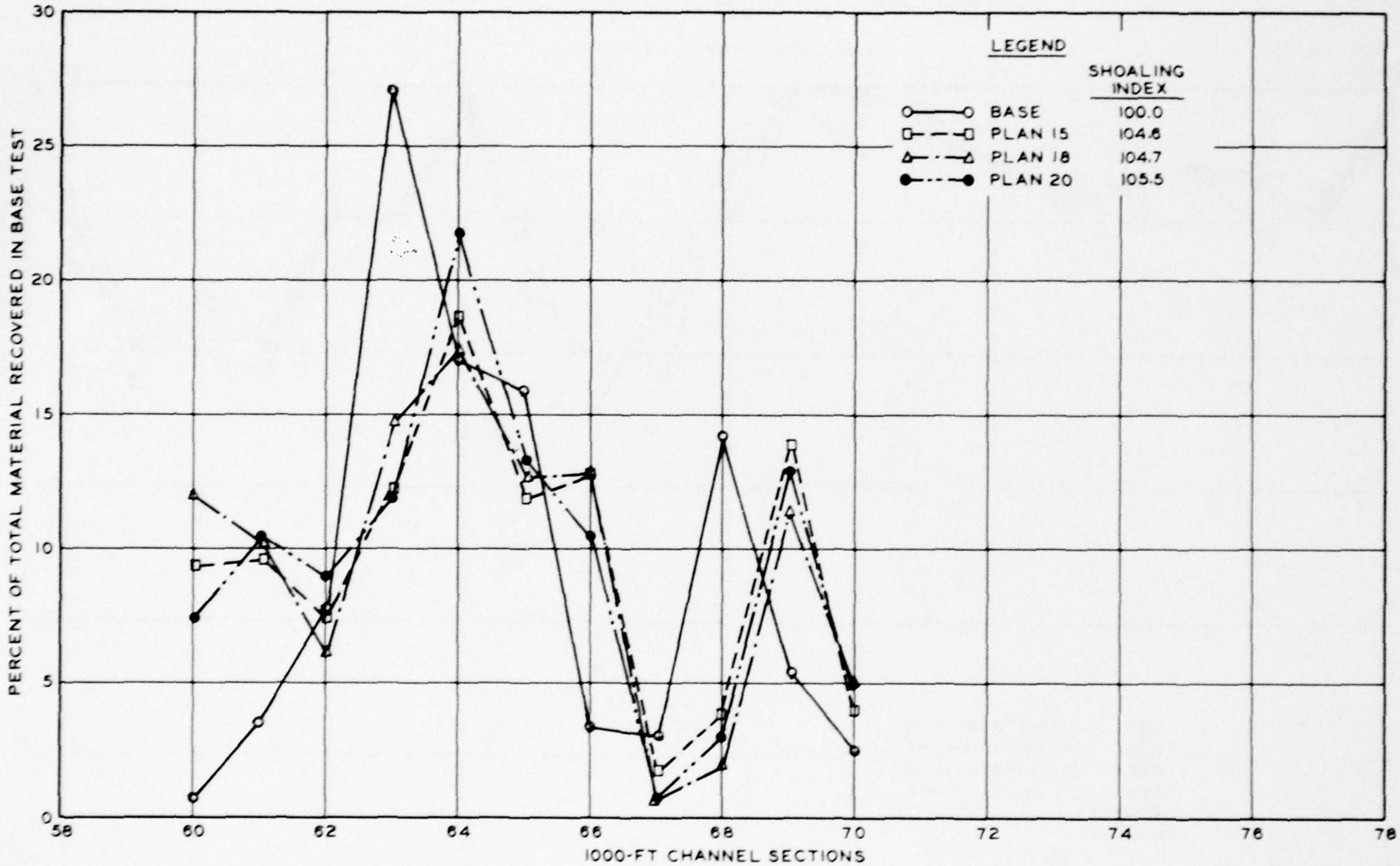


Figure 53. Reach D, shoaling rates and patterns

reach to maintain authorized channel depth should result with the installation of either plan.

Reach E

129. The effects on channel shoaling rates and patterns in reach E (Plate 5) by plans 15, 18, and 20 are shown in Table 7 and in Figure 54. Shoaling index values for the respective three plans are 97.0, 108.6, and 100.3, thus there is an indication of a slight increase in shoaling for plan 18 but no change for plan 15 or 20. Each of the plans caused an upstream shift (1,000 ft) in the shoaling pattern in the downstream third of the reach (sections 71-75), primarily a shift of the base condition peak shoal in section 73 to section 74. This area is located immediately downstream of the western entrance to Mill Cove between Quarantine Island and the disposal area. Shoaling rates and patterns in the remaining sections of reach E were relatively unchanged by either plan. The overall shoaling rates were within the limits of accuracy in repeating tests of this type.

Reach F

130. Table 7 and Figure 55 show the effects of plans 15, 18, and 20 on channel shoaling rates and patterns in reach F (Plate 5). Shoaling index values resulting from tests conducted with above plans are 94.0, 105.2, and 98.8, respectively; thus overall shoaling rates in this reach of the channel essentially unchanged, as indicated by the shoaling index values, each of which is within the limits of accuracy in repeating identical tests of this type.

131. Although total shoaling in this reach was not significantly affected, each plan did result in altering the shoaling patterns that existed for the base conditions. Each of the plans resulted in an upstream shift to the peak shoal in section 93 during base tests to section 94 for the plans. The peak shoaling rate in this area was also increased by each of the three plans. Plan 20 resulted in a very significant increase in the shoaling index at section 89, which is located just upstream of the western entrance to Mill Cove between the disposal area and Reddie Point. The base condition shoaling index at sta 89 was 11.2, and was increased to 20.1 with plan 20 installed. Each plan, more

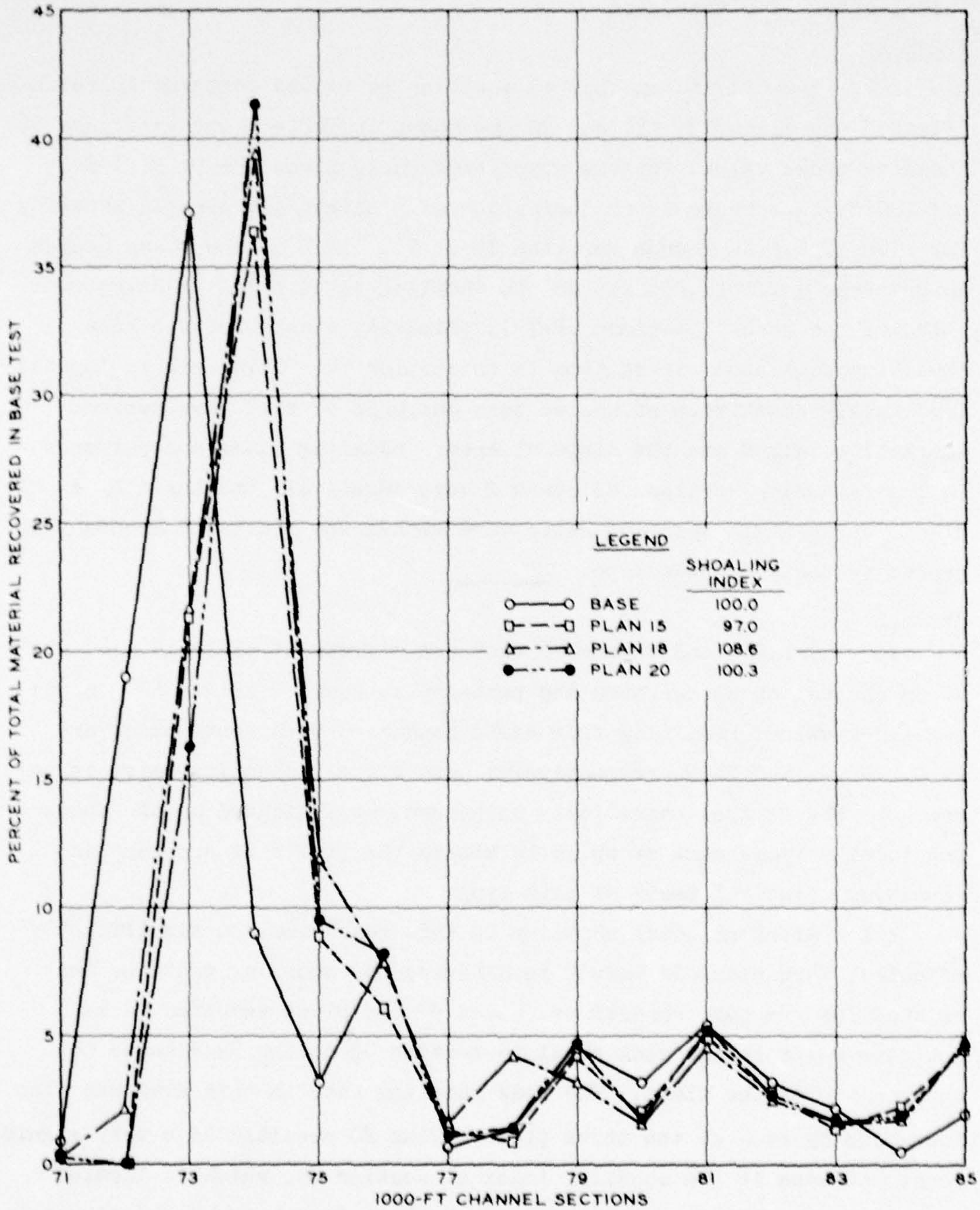


Figure 54. Reach E, shoaling rates and patterns

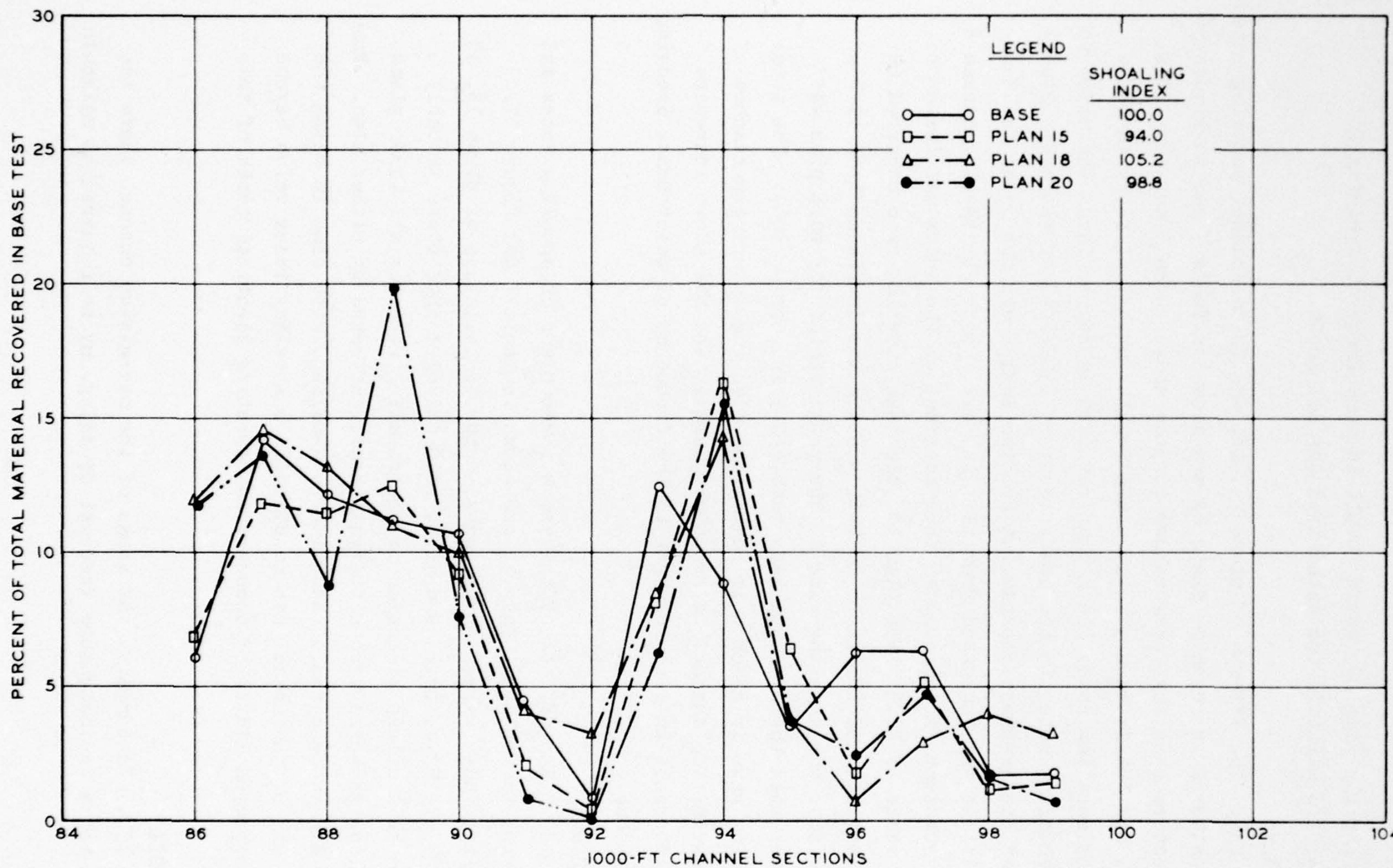


Figure 55. Reach F, shoaling rates and patterns

specifically plan 20, would result in more frequent dredging in reach F to maintain the authorized channel depth.

Reach G

132. The effects of plans 15, 18, and 20 on channel shoaling rates and patterns in reach G (Plate 6) are shown in Table 7 and in Figure 56. Respective shoaling index values for the above three plans are 120.1, 97.8, and 104.2; thus plan 15 would result in a significant increase in the shoaling rate. Each plan resulted in rather large increases to the shoaling rates in the lower sections (102-104) of reach G. Plan 15 caused the greatest increase at section 103, where the index for base conditions was increased from 11.1 to 24.2. Plan 20 likewise caused a very substantial increase at this section, as the index was increased to a value of 21.3. For plan 18, the peak shoaling rate occurred in section 104, and the index in that section was increased from 11.6 to 19.4; thus the shoaling rate in the peak section for each plan was greater than that for the base test (15.5 in section 106). The total shoaling rate in reach G in comparison with the downstream reaches of the navigation channel is relatively small, and the above increases should result in minor changes to the frequency of maintenance dredging operations.

Reach H

133. The effects of the above three plans on shoaling rates and patterns in reach H (Plate 4) are shown in Table 7 and Figure 57. Shoaling index values resulting with the installation of plans 15, 18, and 20 are 93.1, 86.7, and 93.4, respectively; thus there probably would be a slight reduction in the shoaling rate for all three plans. Shoaling patterns were not significantly affected by either plan. Each plan did cause a small reduction in shoaling, with plan 18 being the only one of the three that resulted in a shoaling index value beyond the expected limits of accuracy in repeating identical tests of this type.

Summary

134. In summary, the areas of the navigation channel where the plan tests indicate more frequent dredging may be required to maintain

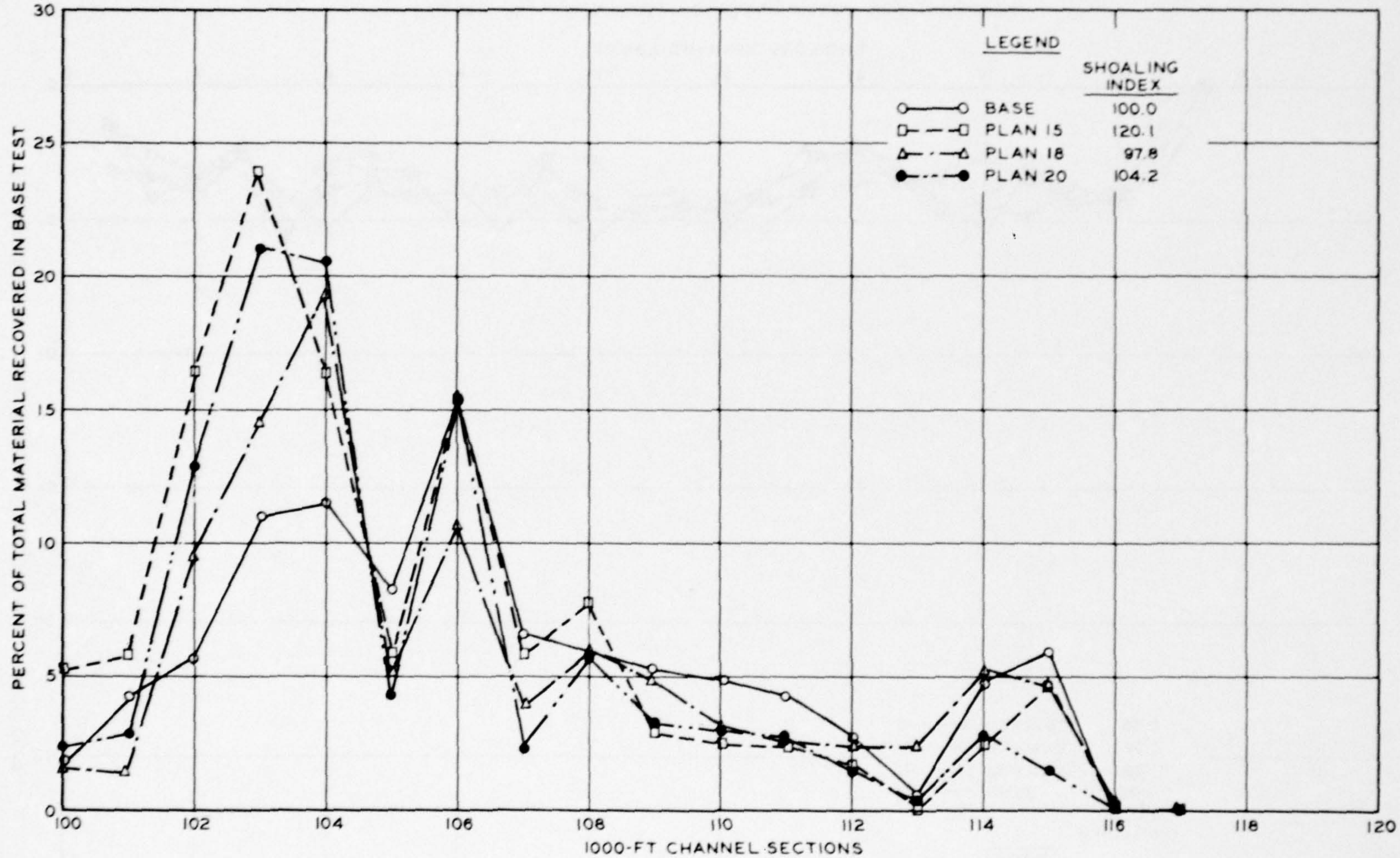


Figure 56. Reach G, shoaling rates and patterns

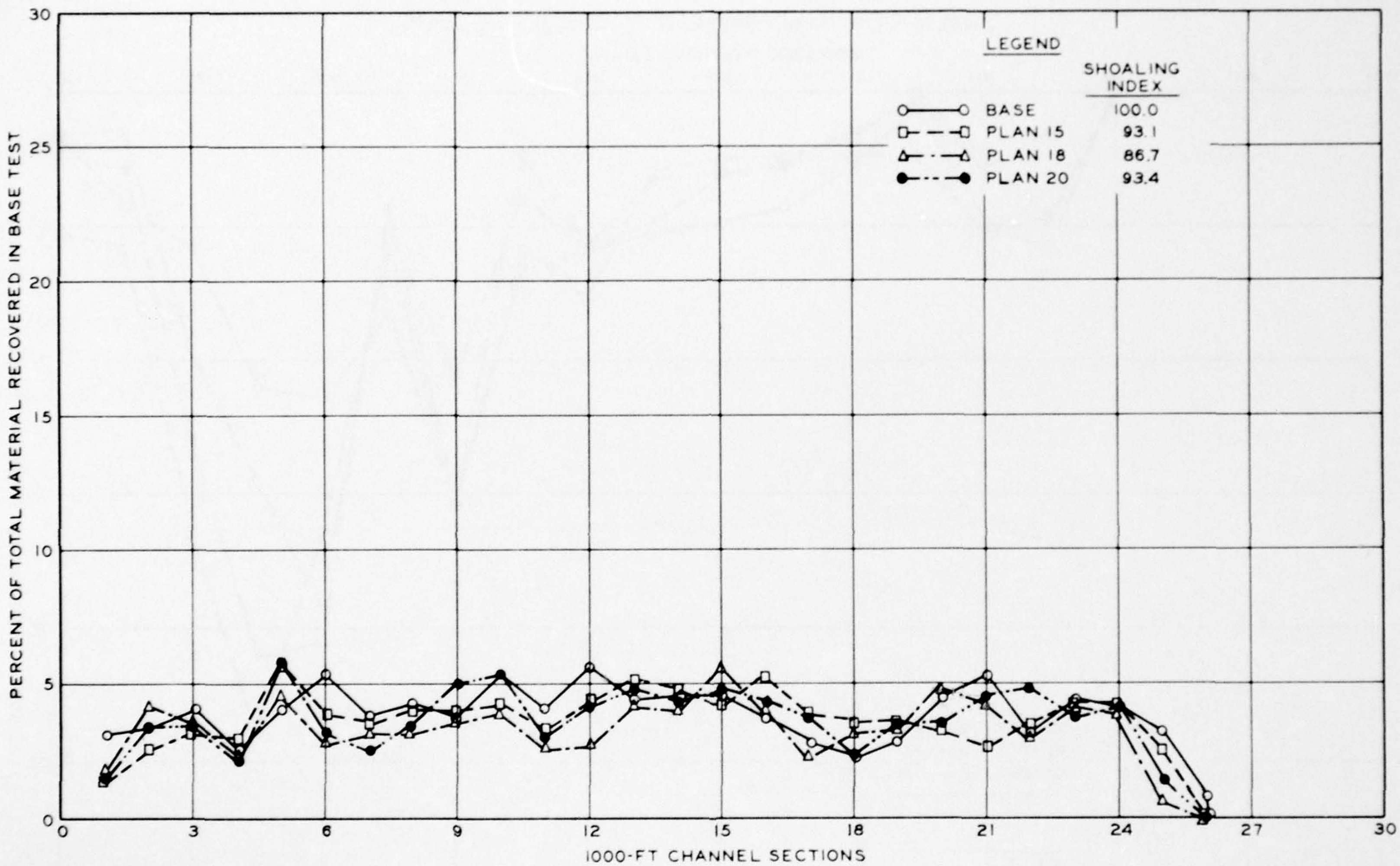


Figure 57. Reach H, shoaling rates and patterns

the authorized depth average were: (a) just above the entrance to the old Back River channel along Blount Island (section 47), (b) above the mouth of Trout River (section 94; also section 89 for plan 20), and (c) in Jacksonville Harbor (sections 102, 103, 104, and 106). Shifts in the location of peak shoaling areas were indicated for reaches B, D, E, F, and G. A reduction in the potential for peak shoaling is indicated for an area above the east entrance to Mill Cove at section 63. The following tabulation summarizes the overall effects of the three plans on channel shoaling and illustrates the very close similarity in effects resulting from the three plans.

	Base		Plan 15		Plan 18		Plan 20	
Reach No.	Volume cc	Shoaling Index	Volume cc	Shoaling Index	Volume cc	Shoaling Index	Volume cc	Shoaling Index
B	10,530	100.0	10,685	101.5	10,775	102.3	11,100	105.4
C	19,405	100.0	18,155	93.6	18,515	95.4	18,635	96.0
D	6,197	100.0	6,485	104.6	6,490	104.7	6,535	105.5
E	9,828	100.0	9,535	97.0	10,675	108.6	9,860	100.3
F	3,435	100.0	3,230	94.0	3,615	105.2	3,395	98.8
G	1,032	100.0	1,240	120.1	1,010	97.8	1,075	104.2
H	8,710	100.0	8,110	93.1	7,550	86.7	8,135	93.4
B-H	59,137	100.0	57,440	97.1	58,630	99.1	58,735	99.3

PART IV: CONCLUSIONS AND RECOMMENDATIONS

Conclusions

135. On the basis of visual observations, analysis of surface current pattern photographs, and economic considerations, 3 of the 20 plans considered were selected for detailed testing to determine their effects on hydraulics, salinities, and dye flushing in Mill Cove and the navigation channel and channel shoaling in the navigation channel. Each of the three plans involved included an enlarged weir opening 1,300 ft wide by 12 ft deep at msl and the relocation of approximately 1,400 ft from the west end of the disposal island located off Reddie Point to the east end of the disposal island. The plans selected were:

a. Plan 15, involved weir dimensions and disposal island changes in combination with the construction of a triangular-shaped island inside Mill Cove opposite the weir opening.

b. Plan 18, included only the weir dimension and the disposal island relocation changes.

c. Plan 20, included the weir opening dimension and disposal island relocation changes in combination with the enlargement of Quarantine Island into Mill Cove immediately upstream from the weir opening.

136. Each of the three plans resulted in minimum effects to tide levels in Mill Cove or in the immediate area surrounding the cove. Low-water levels in Mill Cove would generally be lowered by each plan about 0.1 ft, and high-water levels would be relatively unaffected. The greatest effect on tides was the rate of filling and emptying of Mill Cove.

137. Effects of the three plans on maximum current velocities in the navigation channel were minimal. Maximum ebb and flood currents downstream from the weir opening and upstream from Reddie Point were increased slightly with each plan. Maximum currents, both ebb and flood, in the navigation channel paralleling Mill Cove were generally decreased by each plan. This slight decrease was caused by the redistribution of channel flow from the main channel through the enlarged

openings into and through Mill Cove. Upstream and downstream from this zone maximum currents were increased slightly.

138. Each of the plans increased the extent of crosscurrents in the navigation channel near the east entrance to Mill Cove. Major changes occurred during the periods of time prior to maximum flood and ebb. At strength of flood and ebb, crosscurrents do not occur.

139. Flow predominance values at stations located along the center line of the navigation channel were changed slightly by each plan, and were very similar. Surface flow predominance downstream from the weir opening was generally increased in the flood direction; while at stations located in the portion of the channel parallel to Mill Cove and upstream from Reddie Point, the opposite effect was observed as flow predominance was strengthened in the ebb direction. Flow predominance values observed at the surface depth at channel center-line stations were always in the ebb direction, and the predominant direction was not changed by either plan.

140. Effects on bottom depth flow predominance were very similar as each plan resulted in trends and changes generally in the same direction and magnitude. Changes in bottom depth flow predominance downstream from the weir opening were generally toward weaker flood flows, opposite from the effects observed at the surface depth. Flow predominance values at stations located upstream from the weir were generally changed to weaker ebb, from essentially balanced to flood, or to stronger flood, again opposite from observations at the surface depth.

141. Flow predominance and maximum currents at stations throughout Mill Cove were affected considerably. Overall flow predominance in the eastern or downstream third of the cove was increased in the ebb direction. At stations where an ebb predominance existed, during base conditions, each plan strengthened flow in that direction; while at stations where flood predominance was noted during base conditions, this was either reversed or weakened considerably. Predominance values at stations located in the central and upstream areas of Mill Cove were generally toward a stronger flood direction with the addition of the plans. However, exceptions to this general trend were noted at several locations.

142. Maximum currents throughout the cove both in the flood and ebb direction were considerably higher than those observed during base tests. Each plan resulted in average maximum current velocities through the cove generally about twice the magnitude of those observed during base tests. Base condition maximum current velocities averaged about 0.8 fps, while each of the plans resulted in maximum velocities of about 1.5 fps. Very little difference was noted between maximum ebb currents and maximum flood currents.

143. Maximum current velocities associated with plan 15 (triangular-shaped island inside weir opening) would be in the range that would tend to cause scour problems in the area between the proposed island and Quarantine Island. This area would require bank and bottom protection to prevent development of adverse scour.

144. Current slacks and phase of flow throughout the cove were affected by each plan. Each plan resulted in slack periods and flood and ebb phases generally more in agreement with those observed in the adjacent navigation channel. During base tests, currents in the cove ran in the opposite direction and out of phase with channel currents for as long as 2 to 5 hr. Each of the plans caused the flow in Mill Cove to be nearly in phase at the west entrance. The phasing becomes more out of phase until low- and high-water slacks occur approximately 2 hr earlier at the east entrance to Mill Cove than in the navigation channel.

145. The hourly surface current patterns are a very good indicator of flushing changes in Mill Cove because of the very shallow depths in the cove. These photographs indicate marked improvement in flushing of the cove. Generally, each of the plans is similar in the middle and western end of the cove. In the area from Marian Island to the southeast, the flushing of each plan is significantly improved but markedly different for each plan. In the extreme southeast area, which presently appears to have the poorest circulation, plan 15 appears to improve flushing in a larger percentage of the area the best while plan 20 is better than plan 18.

146. Each of the plans results in a distinct trend for slight salinity increase in the navigation channel near the lower entrance to

Mill Cove relative to other portions of the navigation channel. A trend for slightly reduced salinity occurred with each plan near the upper entrance and above the upper entrance in the navigation channel. Each plan resulted in increases in salinity levels in Mill Cove. Plan 18 resulted in the largest average increase in cove salinities with the north shore incurring a higher increase than the south shore. Plan 15 caused a lesser increase in the average salinity with the north shore also incurring a higher increase relative to the south. Plan 20 caused the least increase in average salinities with a significantly more uniform increase throughout Mill Cove. Maximum increases occurred in the central portion of the cove; changes became progressively less at stations near the weir and extreme western end of the cove. Each plan caused the range of salinity concentrations (difference from maximum to minimum) throughout the cove to increase at essentially all measurement locations.

147. Each of the three plans resulted in very similar and minimum effects on dye concentrations at stations along the navigation channel resulting from dye released in Mill Cove, except that significant increases were noted in the area adjacent to Mill Cove (mile 10 to mile 18). Likewise, the effects of the plans on dye concentrations along the channel resulting from the Mathews Bridge release were similar and minimum. In general, however, concentrations for plan 18 were less than those for the base condition, and those for plans 15 and 20 were higher than those for the base condition.

148. Surface depth high-water-slack dye concentrations (Mill Cove release) observed along the channel with each plan were generally lower than those for the base test downstream from mile 10 and higher than those for the base test from mile 12 to mile 24. Bottom dye concentrations (high-water slack) were not affected to the extent that surface concentrations were; however, the general trend was toward slightly higher concentrations. Plan 18 showed a slightly stronger ability to reduce dye concentrations, particularly in the areas of the channel upstream and downstream from the portion of the channel adjacent to the cove (mile 10 to mile 20). Surface depth low-water-slack dye

concentrations (Mill Cove release) were generally lower than those for the base test downstream from mile 9 and higher than those for the base test upstream from this point. Bottom depth low-water-slack dye concentrations were generally higher than those for the base test downstream from about mile 11 to mile 18 and lower than those for the base test upstream from mile 18.

149. For the Mill Cove dye release, high-water-slack dye concentrations in Mill Cove were, like salinity concentrations, affected the greatest amount in the central portion of the cove. At both high- and low-water slack, plan 20 resulted in greatest benefit to flushing in the extreme eastern end of the cove, an area presently plagued with poor flushing.

150. High-water-slack surface dye concentration (Mathews Bridge release) showed plans 20 and 15 to be generally higher than that for the base condition over the entire length of the navigation channel, while plan 18 was generally lower than that for the base condition downstream of mile 17 and upstream of mile 29. Plan 20 resulted in dye concentrations generally higher than either plan 15 or 18. Bottom depth high-water-slack dye concentrations followed the same pattern as established at the surface with plans 15 and 20 higher and plan 18 generally lower downstream of mile 19 and upstream of mile 28 than that for the base condition. Again, plan 20 had higher concentrations than plans 15 or 18.

151. Low-water-slack surface and bottom depth dye concentrations (Mathews Bridge release) were generally higher than those for the base condition over the entire channel; however, plan 18 showed lower concentration downstream from mile 10 and upstream from mile 25. Again, as observed at high-water slack, plan 20 had higher dye concentrations than plans 15 or 18.

152. High-water-slack dye concentrations in Mill Cove resulting from the Mathews Bridge release followed the same pattern as that observed in the navigation channel. Plan 20 resulted in highest concentrations, while plan 15 was lowest. Generally, plans 15 and 20 dye concentrations were higher and plan 18 was lower than those observed

during base tests, more so in the central and western part of the cove. In this case, however, increased concentration represents improved flushing, as described in paragraph 110.

153. Low-water-slack dye concentrations in Mill Cove (Mathews Bridge release) followed the same trend as that observed during high-water slack in respect to effectiveness of plans. Plan 20 had highest concentrations in comparison with plans 15 and 18. However, each plan resulted in dye concentrations higher than those observed for base conditions in all but a few locations throughout the cove. In this instance, Mathews Bridge release, dye concentrations higher than those for base conditions indicate improved flushing in Mill Cove.

154. Minimal changes to overall shoaling rates and patterns should result from any of the plans. The effects of each plan were very similar and in regard to overall shoaling rates, the rates were generally within the limits of accuracy in repeating identical model tests of this type. The areas of the navigation channel where the plan tests indicate more frequent dredging (as the result of an increase in the peak section shoaling rate) may be required to maintain the authorized depth were: (a) just above the entrance to the old Back River channel along Blount Island, (b) above the mouth of Trout River, and (c) in Jacksonville Harbor. Shifts in the location of peak shoaling areas were indicated just upstream of Sisters Creek, just upstream of Cedar Creek, along Quarantine Island, just below the west entrance to Mill Cove, just upstream of Reddie Point, and in Jacksonville Harbor. A reduction in peak shoaling is indicated for the channel reach adjacent to Quarantine Island.

Recommendations

155. Results from each of the three plans were very similar. Plan 20 does show a slight advantage in respect to maximum current velocities through critical areas and improvement in flushing, especially in the eastern end of Mill Cove. Based on this slight advantage, plan 20 is recommended to improve flushing in Mill Cove.

Table 1

Flow Predominance

Station No.	Base Surface	Base Mid-depth	Base Bottom	Plan 15 Surface	Plan 15 Mid-depth	Plan 15 Bottom	Plan 18 Surface	Plan 18 Mid-depth	Plan 18 Bottom	Plan 20 Surface	Plan 20 Mid-depth	Plan 20 Bottom
Navigation Channel Stations												
3A	-15.3	-2.9	+12.4	-12.2	-1.8	+4.6	-23.1	-3.3	+9.6	-24.6	-4.2	+7.5
5A	-20.7	+5.9	+13.3	-12.2	-3.5	+7.8	-29.4	+3.2	+13.5	-29.5	+2.2	+15.2
7B	-29.8	+1.2	+24.4	-21.4	-7.7	+5.2	-25.8	-7.3	+16.3	-22.5	+8.9	+11.9
9B	-17.3	-3.0	+4.9	-7.6	+1.3	-4.4	-9.5	-11.0	+0.6	-11.9	-2.2	-4.7
10A	-20.7	+2.1	+14.4	-16.5	+7.7	+17.9	-31.6	+9.2	+17.5	-23.5	+6.0	+19.3
10.5	-23.5	-4.5	+42.1	-34.9	+0.3	+18.2	-40.8	+13.0	+30.1	-34.0	+0.7	+30.6
12A	-12.6	-3.0	-0.9	-11.1	-2.0	+1.4	-20.3	-3.2	+6.5	-20.4	-2.7	+6.8
14A	-11.5	-12.2	-10.6	-17.2	-9.5	-6.2	-27.9	-12.8	-2.8	-24.3	-11.8	-3.6
16A	-11.2	-4.7	+1.4	-4.8	-0.6	+7.3	-12.6	-2.7	+5.2	-10.9	-4.6	+4.6
18A	-16.2	+15.3	+48.0	-12.2	+14.4	+46.0	-17.3	+13.2	+48.3	-15.2	+15.1	+47.9
20A	-13.6	-8.1	0.0	-15.9	-0.9	+5.7	-15.8	-5.2	+0.8	-13.1	-5.1	-1.7
21B	-10.7	-3.5	+3.2	-7.9	-0.5	+13.0	-7.8	-3.3	+5.1	-9.0	-0.9	+4.3
24A	-10.1	-9.2	-2.6	-12.9	-0.4	-1.3	-11.8	-5.0	-11.4	-9.4	-4.6	-9.7
Mill Cove Stations												
MCA	0.6	--	3.0	-8.4	--	-1.6	-12.6	--	2.1	-12.0	--	-1.9
MCB	-12.9	--	--	-38.4	--	--	-26.9	--	--	-34.0	--	--
MCC	+27.5	--	--	+11.8	--	--	+21.5	--	--	-7.0	--	--
MCD	+30.7	--	--	+11.1	--	--	+11.4	--	--	+22.4	--	--
MCE	--	+2.0	--	--	-2.7	--	--	-16.0	--		-9.6	--
MCF	--	-30.0	--	--	-9.8	--	--	-5.5	--		-36.3	--
MCG	--	-4.0	--	--	-3.7	--	--	-1.1	--		-1.4	--
MCH	--	-10.5	--	--	+3.3	--	--	-9.7	--		-7.9	--
MCJ	--	+2.7	--	--	+4.4	--	--	-6.8	--		+2.7	--
MCK	--	+0.4	--	--	+4.6	--	--	-4.8	--		+2.6	--
MCL	--	-7.8	--	--	+20.6	--	--	-0.1	--		+12.1	--
MCM	--	+4.7	--	--	-5.1	--	--	-14.1	--		-13.7	--
MCN	--	-0.5	--	--	-2.3	--	--	-4.5	--		-4.8	--
MCP	--	-14.5	--	--	-5.2	--	--	-4.3	--		-4.0	--

Note: A negative sign (-) denotes flow predominance in the ebb direction. A positive sign (+) denotes flow predominance in the flood direction.

Table 2

Maximum Velocities, fps, in Mill Cove

Station No.	Base Ebb	Base Flood	Plan 15 Ebb	Plan 15 Flood	Plan 18 Ebb	Plan 18 Flood	Plan 20 Ebb	Plan 20 Flood
MCA (surface)	-3.7	3.8	-3.2	2.0	-2.2	2.0	-3.0	1.8
(bottom)	-3.7	4.3	-2.9	1.9	-2.1	2.4	-2.5	1.9
Average	-3.7	4.0	-3.0	2.0	-2.2	2.2	-2.7	1.9
MCB	-0.3	0.3	-0.5	0.4	-0.6	0.3	-0.4	0.3
MCC	-0.2	0.5	-0.5	0.7	-0.2	0.4	-0.5	0.4
MCD	-0.2	0.6	-1.8	1.8	-0.5	1.0	-0.6	1.0
MCE	-0.7	0.7	-1.5	1.7	-2.5	1.1	-3.5	2.2
MCF	-0.5	0.4	-4.6	2.6	-2.8	2.8	-1.8	0.3
MCG	-1.1	0.8	-1.7	1.5	-2.1	2.1	-2.1	2.1
MCH	-1.2	0.6	-1.8	2.3	-2.7	1.9	-2.6	2.0
MCJ	-0.8	0.9	-1.3	1.3	-1.8	1.6	-1.6	1.6
MCK	-1.3	0.8	-1.1	1.6	-1.7	1.4	-1.4	1.4
MCL	-1.5	0.7	-0.8	1.3	-1.7	1.4	-1.3	1.2
MCM	-0.9	0.9	-1.3	1.1	-1.9	1.1	-1.5	0.8
MCN	-2.4	1.3	-1.5	1.3	-1.8	1.8	-1.5	1.5
MCP	-3.1	2.8	-2.7	2.4	-3.1	3.3	-2.9	3.0
Average*	-0.9	0.7	-1.5	1.5	-1.7	1.4	-1.6	1.2

* Station A and P excluded.

Table 3

Average Salinities, ppt

Station No.	Base Surface	Base Mid-depth	Base Bottom	Base Depth average	Plan 15 Surface	Plan 15 Mid-depth	Plan 15 Bottom	Plan 15 Depth average	Plan 18 Surface	Plan 18 Mid-depth	Plan 18 Bottom	Plan 18 Depth average	Plan 20 Surface	Plan 20 Mid-depth	Plan 20 Bottom	Plan 20 Depth average
Navigation Channel Center-line Stations																
0B	23.7	30.4	32.1	28.7	22.7	30.0	31.9	28.2	23.0	29.2	30.9	27.7	23.3	28.9	30.6	27.6
3A	20.4	27.4	29.8	25.9	20.2	27.0	29.9	25.7	20.6	26.1	28.9	25.2	19.8	25.7	28.5	24.6
5A	19.4	26.1	28.3	24.6	18.0	25.7	28.0	23.9	19.3	25.4	28.1	24.3	18.4	25.0	26.9	23.4
7B	16.8	22.6	24.6	21.3	16.3	21.3	23.5	20.4	15.8	22.6	25.1	21.1	15.9	21.8	24.2	20.6
9B	14.6	19.0	23.1	18.9	14.2	19.4	23.6	19.0	14.4	19.5	23.2	19.0	14.3	18.9	22.9	18.7
10A	12.7	16.9	22.5	17.4	13.4	17.1	23.1	17.9	13.5	17.1	22.5	17.7	12.8	16.7	22.2	17.2
11A	12.0	15.9	19.2	15.7	11.8	16.8	19.7	16.1	12.8	17.0	19.5	16.4	11.1	16.6	19.2	15.6
14A	9.6	13.5	15.7	12.9	8.4	12.9	14.9	12.0	9.2	13.6	15.6	12.8	7.7	13.0	14.9	11.8
15A	8.9	13.7	15.4	12.7	8.5	12.9	14.6	12.0	9.4	13.2	15.0	12.5	7.8	12.4	14.6	11.6
16A	8.2	12.5	14.6	11.8	7.3	11.9	13.9	11.0	8.4	12.1	14.2	11.5	6.8	11.1	14.0	10.6
17A	7.3	11.5	13.6	10.8	7.1	11.0	13.7	10.6	5.5	11.2	13.9	10.2	6.1	11.1	13.6	10.2
18A	8.4	11.0	13.9	11.1	7.0	9.7	13.1	9.9	6.4	10.0	13.5	9.9	7.1	9.9	12.6	9.8
20A	5.7	7.7	9.3	7.6	5.1	6.1	7.5	6.2	5.0	6.1	7.9	6.3	4.6	5.7	7.8	6.0
24A	3.7	4.4	4.7	4.3	3.3	3.6	3.8	3.6	3.7	4.1	4.3	4.0	2.8	3.2	3.4	3.1
28B	2.8	3.3	3.9	3.3	2.5	2.9	3.1	2.8	2.6	2.9	3.4	2.9	1.8	2.2	2.7	2.2
33A	1.6	2.1	2.3	2.0	1.6	2.0	2.1	1.9	1.7	2.1	2.2	2.0	0.9	1.1	1.3	1.1
Mill Cove Stations																
MCA	--	13.0	--	13.0	--	14.9		14.9		15.0		15.0		14.1		14.1
MCB	--	11.9	--	11.9	--	11.8		11.8		12.9		12.9		11.4		11.4
MCC	--	12.3	--	12.3	--	13.7		13.7		13.5		13.5		12.9		12.9
MCD	--	12.2	--	12.2	--	14.8		14.8		14.0		14.0		13.3		13.3
MCE	--	12.0	--	12.0	--	13.6		13.6		14.9		14.9		14.2		14.2
MCF	--	12.1	--	12.1	--	14.2		14.2		15.6		15.6		14.5		14.5
MCG	--	12.3	--	12.3	--	14.5		14.5		14.5		14.5		13.9		13.9
MCH	--	11.8	--	11.8	--	15.0		15.0		15.6		15.6		14.0		14.0
MCJ	--	11.2	--	11.2	--	13.1		13.1		14.0		14.0		13.0		13.0
MCK	--	9.7	--	9.7	--	13.1		13.1		14.1		14.1		12.1		12.1
MCL	--	10.0	--	10.0	--	11.1		11.1		11.2		11.2		10.6		10.6
MCM	--	10.8	--	10.8	--	10.8		10.8		11.7		11.7		10.9		10.9
MCN	--	9.0	--	9.0	--	11.5		11.5		12.8		12.8		10.8		10.8
MCP	--	9.9	--	9.9	--	9.7		9.7		10.6		10.6		9.6		9.6

Table 4

High- and Low-Water Slack Dye Concentrations

Mill Cove Release

Cycle	High-Water Slack Dye Concentrations, ppb: Base Surface	Base Bottom	Plan 15 Surface	Plan 15 Bottom	Plan 18 Surface	Plan 18 Bottom	Plan 20 Surface	Plan 20 Bottom	Low-Water Slack Dye Concentrations, ppb: Base Surface	Base Bottom	Plan 15 Surface	Plan 15 Bottom	Plan 18 Surface	Plan 18 Bottom	Plan 20 Surface	Plan 20 Bottom
Station - Sump																
1	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--
2	0	--	0	--	0	--	0	--	0	--	1	--	0	--	0	--
3	0	--	0	--	0	--	0	--	1	--	0	--	0	--	0	--
4	1	--	0	--	0	--	0	--	2	--	0	--	0	--	1	--
5	1	--	0	--	0	--	0	--	2	--	1	--	0	--	1	--
6	2	--	0	--	0	--	0	--	2	--	2	--	0	--	2	--
8	3	--	1	--	0	--	2	--	3	--	2	--	0	--	2	--
10	4	--	2	--	0	--	2	--	4	--	2	--	1	--	3	--
12	5	--	3	--	1	--	4	--	4	--	3	--	2	--	4	--
14	6	--	6	--	3	--	5	--	6	--	5	--	3	--	4	--
16	7	--	8	--	5	--	6	--	7	--	6	--	5	--	7	--
Station - Ocean																
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	1	1	1	0	0	0	0	0	1	1	0	0	4	0	0	0
4	3	1	2	0	0	1	0	0	3	2	2	2	5	0	1	1
5	5	2	2	0	0	1	2	0	8	2	4	3	7	2	4	1
6	10	2	3	1	13	1	2	0	17	3	17	3	29	3	10	2
8	10	2	4	2	24	4	5	1	22	4	23	4	10	4	16	3
10	13	4	5	2	30	5	12	2	28	6	31	5	43	7	26	5
12	15	5	9	2	45	7	14	3	33	12	45	6	63	8	34	10
14	19	6	9	3	48	7	20	3	113	12	43	8	111	11	42	11
16	17	7	23	5	63	9	27	4	120	17	49	9	158	11	58	12
Station OB																
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	1	1	1	2	0	5	0
3	7	1	0	1	2	0	0	0	17	1	15	1	19	0	29	0
4	17	2	3	1	4	0	4	0	43	2	38	1	41	0	58	1
5	34	1	4	1	11	0	6	0	75	3	67	2	63	1	91	1
6	56	2	5	2	14	0	12	0	111	3	81	3	88	1	121	2
8	88	2	9	2	22	0	15	1	152	5	138	4	134	3	159	2
10	124	3	74	4	41	0	22	2	200	7	161	5	169	3	182	4
12	138	4	76	5	63	0	38	3	230	11	190	6	187	7	188	10
14	164	6	85	5	59	0	49	6	273	12	202	12	210	8	205	11
16	188	9	88	5	65	2	51	7	286	14	220	17	234	11	223	15
Station 3A																
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	2	1	1	0	2	0	0	0	1	1	9	1	5	5	0	2
3	12	2	10	5	12	1	9	0	20	16	41	32	25	19	28	24
4	39	3	19	7	18	0	14	3	45	39	72	54	54	43	64	51
5	64	5	31	9	20	4	25	3	82	69	95	81	72	65	98	82
6	93	8	35	9	25	13	34	6	113	100	127	101	102	81	130	105
8	142	11	62	14	43	14	53	11	152	133	168	143	150	124	170	151
10	146	15	71	17	50	14	66	14	188	170	191	174	187	158	188	170
12	164	21	76	20	61	13	73	14	242	212	227	185	204	181	211	188
14	212	36	94	23	74	16	80	19	261	242	239	209	234	198	217	193
16	212	24	148	29	79	19	82	21	273	255	252	233	252	216	229	205
Station 5A																
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	4	1	3	0	1	0	2	0	23	1	15	12	24	0	44	1
3	22	2	26	4	13	1	23	3	47	3	48	21	79	4	80	12
4	45	3	44	9	29	2	46	5	102	9	81	55	92	17	96	26
5	73	6	64	12	52	4	71	8	118	19	113	77	134	26	142	42

(Continued)

Table 4 (Continued)

Cycle	High-Water Slack Dye Concentrations, ppb: Base Surface	Base Bottom	Plan 15 Surface	Plan 15 Bottom	Plan 18 Surface	Plan 18 Bottom	Plan 20 Surface	Plan 20 Bottom	Low-Water Slack Dye Concentrations, ppb: Base Surface	Base Bottom	Plan 15 Surface	Plan 15 Bottom	Plan 18 Surface	Plan 18 Bottom	Plan 20 Surface	Plan 20 Bottom
Station 5A (Continued)																
6	100	9	82	16	68	5	96	12	158	28	147	98	146	45	170	66
8	138	13	116	20	113	8	142	20	212	45	181	130	210	68	217	80
10	164	15	148	29	134	10	153	27	267	64	216	131	228	77	235	116
12	194	22	148	31	163	13	188	34	317	75	240	136	271	92	260	119
14	218	24	171	33	175	15	193	40	317	104	265	142	283	97	266	130
16	230	31	194	38	198	18	205	46	349	118	277	171	315	118	278	148
Station 7B																
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	12	4	15	3	6	4	8	1	80	16	15	11	69	5	62	8
3	40	13	39	14	21	5	30	14	158	24	61	25	85	15	93	24
4	58	17	57	26	49	8	62	15	194	47	90	50	115	35	147	46
5	97	30	81	42	67	11	89	20	224	82	124	75	144	52	188	69
6	142	52	109	46	99	14	128	38	292	113	160	97	162	74	235	78
8	170	60	152	60	131	45	147	44	317	144	177	141	238	156	247	128
10	218	64	179	78	185	52	164	60	413	188	224	156	263	162	290	159
12	267	91	190	87	202	58	182	64	407	218	248	173	300	167	316	164
14	292	102	208	89	208	65	193	66	413	236	261	185	344	250	328	182
16	298	106	226	123	232	94	211	66	473	249	285	214	344	269	235	193
Station 9AB																
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	43	1	17	1	27	3	32	3	14	0	14	2	2	0	11	0
3	86	6	37	10	56	9	78	10	32	3	34	10	18	6	45	3
4	127	16	71	17	74	16	108	19	56	12	69	21	39	17	74	14
5	128	26	105	25	112	26	145	30	82	24	101	37	69	33	110	27
6	176	38	139	37	147	33	167	41	100	41	128	57	94	61	145	41
8	194	56	164	62	179	56	220	61	133	69	167	75	151	87	185	69
10	224	77	193	64	220	76	232	81	164	84	191	97	185	103	202	87
12	249	100	229	82	244	83	250	90	200	122	220	118	208	126	214	103
14	273	113	247	91	256	99	256	94	218	138	256	134	244	167	232	117
16	298	115	272	112	293	108	293	108	242	149	275	150	263	173	256	126
Station 9B																
1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
2	28	1	20	3	13	4	27	4	47	5	48	11	29	16	62	9
3	91	4	44	11	44	9	48	10	124	21	127	26	75	33	136	25
4	142	12	71	14	70	15	82	17	182	33	141	50	120	50	186	53
5	158	19	96	24	84	22	113	25	206	52	186	75	140	77	209	84
6	164	29	123	31	116	28	134	35	279	64	192	95	186	93	245	106
8	286	41	153	44	157	42	180	50	292	102	257	144	227	134	282	151
10	298	54	188	55	227	57	215	64	317	128	294	173	270	180	301	180
12	323	69	217	66	233	66	227	70	381	164	326	202	294	186	307	209
14	342	82	229	71	239	203	239	79	394	194	339	208	320	233	339	227
16	374	88	253	82	270	233	264	84	443	206	351	238	371	251	371	233
Station 10A																
1	2	1	2	5	0	0	0	0	0	0	0	0	0	0	0	0
2	11	2	21	9	87	5	98	5	5	17	44	8	19	2	51	7
3	88	6	49	25	103	11	193	13	22	45	79	25	47	14	101	26
4	158	15	76	27	198	21	222	22	58	69	129	56	101	33	142	60
5	176	28	122	37	234	30	234	36	77	86	151	83	129	56	169	85
6	218	39	149	48	258	40	258	47	111	111	180	104	175	83	198	101
8	230	64	173	70	289	63	321	67	146	146	233	148	228	124	258	164
10	407	77	196	81	308	85	346	83	176	200	270	177	258	169	277	193
12	420	97	232	95	327	92	372	96	236	224	301	212	283	187	289	216
14	479	113	250	102	372	117	378	98	267	249	313	718	327	222	314	234
16	533	117	256	125	378	113	405	101	279	858	326	817	359	252	327	240

(Continued)

Table 4 (Continued)

	High-Water Slack Dye Concentrations, ppb								Low-Water Slack Dye Concentrations, ppb							
	Base		Plan 15		Plan 18		Plan 20		Base		Plan 15		Plan 18		Plan 20	
Cycle	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom
								Station 11A								
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	43	2	17	10	32	7	32	16	15	18	24	46	17	28	25	43
3	152	9	47	22	67	22	80	19	25	23	55	82	47	60	56	74
4	158	24	83	48	101	34	114	56	45	56	88	139	69	89	83	103
5	164	42	115	61	146	47	158	60	73	73	116	152	103	124	119	118
6	182	56	145	66	193	74	181	78	73	88	150	163	142	164	146	164
8	230	91	179	111	240	98	228	101	97	120	174	209	175	198	181	204
10	255	115	208	125	258	128	246	147	151	182	203	239	210	222	216	234
12	273	138	238	150	308	141	265	149	176	194	239	257	222	234	228	252
14	304	158	263	138	352	141	289	146	194	230	257	270	252	277	246	277
16	387	164	269	173	385	146	302	158	212	249	276	282	265	321	265	289
								Station 14A								
1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
2	6	8	19	15	12	14	23	13	2	0	5	18	4	7	4	19
3	21	27	56	37	31	31	54	35	8	10	16	39	12	21	14	43
4	33	52	76	63	61	55	74	65	15	25	32	77	25	39	26	63
5	58	77	112	90	84	79	110	94	28	43	57	100	38	68	45	103
6	60	106	138	117	131	106	137	126	38	64	66	132	59	113	60	113
8	66	144	162	144	165	157	141	152	64	95	93	151	93	153	94	164
10	73	182	191	185	194	188	193	175	86	129	125	180	120	182	126	175
12	100	218	214	208	229	211	198	204	111	152	143	197	145	217	137	210
14	104	236	244	226	235	235	216	216	129	182	151	221	153	229	149	216
16	138	273	244	238	278	259	240	228	147	200	151	221	165	278	156	234
								Station 15A								
1	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	7	9	22	15	22	15	40	16	6	0	4	15	5	6	2	15
3	27	26	55	32	30	30	74	35	7	9	12	34	9	22	10	33
4	38	56	88	62	61	55	103	40	8	27	23	64	15	35	18	38
5	39	84	120	88	102	81	108	71	23	45	44	93	26	72	69	51
6	45	109	157	116	122	111	126	83	33	69	48	116	41	122	74	130
8	66	151	192	145	170	153	135	152	54	106	79	157	70	153	92	152
10	79	188	209	180	199	188	181	193	71	138	95	180	119	188	108	187
12	102	218	233	209	241	211	228	210	100	164	112	209	108	217	101	204
14	123	230	251	221	253	235	265	222	117	182	112	221	114	229	129	216
16	128	255	276	239	315	259	271	234	123	206	134	233	130	259	124	228
								Station 16A								
1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
2	8	12	23	15	5	18	18	20	5	2	1	16	2	7	2	15
3	22	33	38	37	13	36	57	20	7	9	7	35	5	24	5	34
4	31	58	97	64	21	61	97	24	15	25	16	69	8	40	9	59
5	62	86	132	93	46	86	104	29	18	47	23	96	14	77	39	104
6	75	115	139	118	66	115	129	88	23	69	28	126	20	115	50	138
8	97	146	157	151	66	159	134	159	34	102	47	167	36	157	64	182
10	120	194	157	192	199	194	130	205	47	136	60	193	50	182	66	194
12	124	224	163	209	211	217	142	217	58	176	67	222	59	199	75	235
14	111	242	180	245	247	247	153	235	73	182	80	240	188	223	79	247
16	164	267	264	257	253	278	159	241	82	206	83	246	70	259	97	266
								Station 17A								
1	0	0	22	1	27	13	57	9	0	0	0	0	0	0	0	0
2	7	0	35	13	32	26	72	24	3	0	5	13	14	12	8	11
3	21	37	50	36	59	50	86	46	6	14	18	28	17	28	14	31
4	28	62	68	64	59	70	122	77	9	38	24	63	18	46	20	52
5	35	84	113	93	66	93	125	104	13	58	37	80	21	79	21	90
6	52	115	134	120	81	131	129	141	14	79	47	121	26	113	24	113
8	75	146	157	157	93	159	131	176	25	113	69	163	37	142	33	199
10	104	194	180	186	176	199	130	205	34	151	36	181	50	176	50	194

(Continued)

Table 4 (Continued)

	High-Water Slack Dye Concentrations, ppb								Low-Water Slack Dye Concentrations, ppb							
	Base		Plan 15		Plan 18		Plan 20		Base		Plan 15		Plan 18		Plan 20	
Cycle	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom
								Station 17A (Continued)								
12	118	224	197	227	176	217	165	223	43	188	51	210	66	194	59	217
14	149	255	215	233	170	241	229	235	62	218	58	228	70	229	68	235
16	152	273	215	245	125	266	253	241	58	236	69	246	70	253	72	235
								Station 18A								
1	0	0	41	13	1	8	11	5	0	0	0	0	0	0	0	0
2	9	18	47	29	26	23	44	30	3	0	2	14	3	6	2	12
3	24	39	105	58	46	46	79	57	5	14	5	34	6	23	4	38
4	37	62	114	83	52	70	115	95	7	34	7	67	9	40	5	64
5	60	79	121	114	102	113	136	127	10	56	10	89	11	72	10	106
6	71	109	149	147	131	138	125	147	12	75	14	121	15	111	14	141
8	100	144	146	175	154	176	142	194	18	111	22	164	21	148	19	170
10	124	188	187	204	176	211	182	211	24	147	26	198	29	188	26	205
12	158	218	198	222	235	235	194	229	30	170	38	216	33	205	33	223
14	176	242	234	252	247	259	194	253	35	206	43	234	44	217	41	247
16	200	273	228	265	266	296	211	266	43	212	45	252	46	241	46	253
								Station 20A								
1	2	0	0	3	2	23	9	26	0	0	0	0	0	0	0	0
2	5	9	10	24	8	29	19	29	4	6	0	2	0	0	4	4
3	10	23	23	51	14	36	20	57	5	10	2	6	3	10	5	6
4	21	42	39	89	23	81	33	95	7	21	4	10	4	12	5	14
5	24	69	51	105	40	125	44	148	8	25	7	14	6	20	6	18
6	39	84	71	137	52	154	61	142	12	31	9	18	8	29	8	30
8	62	111	92	152	84	170	97	176	14	45	13	22	13	36	12	33
10	75	158	117	187	97	205	113	199	21	60	19	35	19	50	21	39
12	106	182	142	216	136	229	129	223	24	77	21	37	23	52	23	48
14	115	212	163	228	125	235	152	223	28	140	27	45	26	68	30	66
16	127	224	135	228	153	272	142	241	36	106	29	51	30	68	33	61
								Station 24A								
1	4	2	0	1	1	2	0	2	0	0	0	0	0	0	0	0
2	7	8	1	1	3	6	4	6	0	0	0	0	0	0	0	0
3	9	12	3	5	6	11	9	12	0	4	0	2	0	2	0	2
4	11	17	11	22	8	17	10	18	2	6	0	3	0	4	1	3
5	14	25	17	31	14	24	23	30	2	8	0	5	3	5	2	5
6	19	34	23	43	20	33	25	38	2	10	0	8	5	5	4	6
8	25	43	33	56	33	52	36	59	4	14	2	11	8	6	8	12
10	34	62	49	78	46	68	48	75	7	21	5	18	9	17	12	17
12	41	77	49	87	55	90	61	81	10	26	11	21	11	24	15	22
14	47	93	51	94	61	97	75	99	12	29	14	26	17	25	21	27
16	58	106	54	101	79	111	81	104	16	32	16	33	18	28	24	29
								Station 28B								
1	0	3	0	2	1	1	0	0	0	0	0	0	0	0	0	0
2	0	6	0	3	5	5	0	0	0	0	0	0	0	0	0	0
3	6	7	1	6	6	5	0	5	0	0	0	0	0	0	0	0
4	7	10	2	8	8	9	0	6	0	3	0	0	0	0	0	0
5	9	12	2	12	9	10	2	11	0	6	0	0	0	0	0	0
6	10	16	3	15	10	15	5	12	0	8	0	1	0	0	0	0
8	12	22	6	17	12	20	9	23	0	8	0	3	0	0	0	5
10	19	29	9	30	17	26	15	30	1	9	0	5	0	1	0	6
12	22	36	21	33	18	32	22	35	0	13	0	8	0	3	0	9
14	31	41	24	39	27	44	25	44	0	15	0	9	0	7	1	11
16	38	47	27	44	28	46	27	44	2	17	1	12	1	8	2	17

(Continued)

Table 4 (Continued)

	High-Water Slack Dye Concentrations, ppb								Low-Water Slack Dye Concentrations, ppb							
	Base		Plan 15		Plan 18		Plan 20		Base		Plan 15		Plan 18		Plan 20	
Cycle	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom
Station 33A																
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	2	0	0	0	0	0	2	1	0	0	0	0	0	0	0
10	0	3	0	0	0	0	0	3	0	0	0	0	0	0	0	0
12	0	4	0	0	0	0	0	5	1	0	0	0	0	0	0	0
14	0	6	0	0	0	0	0	8	0	0	0	0	0	0	0	0
16	0	9	0	6	0	2	2	10	0	1	0	0	0	0	0	0
Station BRR																
1	0	--	0	--	0	--	21	--	0	--	0	--	0	--	0	--
2	1	--	2	--	9	--	17	--	0	--	0	--	0	--	0	--
3	3	--	17	--	18	--	44	--	3	--	0	--	0	--	3	--
4	4	--	22	--	29	--	59	--	3	--	3	--	0	--	3	--
5	14	--	58	--	29	--	52	--	11	--	24	--	4	--	9	--
6	17	--	67	--	47	--	79	--	23	--	25	--	11	--	39	--
8	60	--	89	--	87	--	95	--	52	--	58	--	51	--	66	--
10	84	--	108	--	89	--	104	--	58	--	85	--	105	--	89	--
12	102	--	147	--	130	--	136	--	111	--	126	--	117	--	115	--
14	106	--	175	--	158	--	147	--	140	--	142	--	142	--	152	--
16	106	--	193	--	169	--	153	--	142	--	158	--	153	--	142	--
Station TRR																
1	1	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--
2	4	--	1	--	0	--	3	--	6	--	3	--	0	--	3	--
3	6	--	8	--	5	--	6	--	9	--	8	--	7	--	8	--
4	11	--	15	--	11	--	12	--	12	--	19	--	13	--	14	--
5	17	--	23	--	19	--	20	--	20	--	30	--	22	--	23	--
6	23	--	26	--	29	--	29	--	27	--	37	--	33	--	29	--
8	41	--	56	--	56	--	29	--	45	--	56	--	58	--	52	--
10	54	--	71	--	76	--	70	--	60	--	80	--	83	--	72	--
12	71	--	96	--	92	--	88	--	71	--	89	--	101	--	81	--
14	84	--	108	--	105	--	88	--	86	--	101	--	103	--	93	--
16	100	--	110	--	124	--	97	--	95	--	117	--	117	--	111	--
Station MCA																
1	1	1	10	7	35	19	22	5	5	3	35	29	38	222	109	22
2	39	35	55	22	128	78	79	16	188	58	78	152	340	240	188	84
3	170	117	89	53	169	96	136	33	443	146	142	158	391	283	454	104
4	200	164	93	75	210	117	182	68	588	323	175	277	398	346	567	229
5	607	273	138	95	411	128	194	86	664	341	308	509	453	528	586	241
6	645	292	149	116	411	193	199	125	1078	443	352	258	528	547	605	364
8	702	336	237	143	453	198	266	136	1058	515	490	490	566	566	683	382
10	918	443	243	161	528	283	309	159	1768	858	528	528	585	624	723	400
12	978	479	268	207	547	295	309	176	1823	898	585	841	585	643	903	454
14	1018	515	280	195	585	302	309	194	1823	938	643	490	585	663	923	548
16	1098	664	330	231	585	585	353	217	1878	1158	682	472	821	801	964	548
Station MCB																
1	0	--	125	--	144	--	26	--	0	--	0	--	0	--	0	--
2	58	--	415	--	405	--	134	--	6	--	112	--	19	--	34	--
3	64	--	699	--	453	--	205	--	18	--	149	--	193	--	84	--
4	323	--	450	--	490	--	211	--	39	--	141	--	277	--	165	--
5	276	--	544	--	547	--	266	--	109	--	216	--	453	--	247	--
6	391	--	852	--	722	--	272	--	626	--	258	--	547	--	360	--
8	838	--	621	--	741	--	366	--	741	--	340	--	604	--	379	--

(Continued)

Table 4 (Continued)

	High-Water Slack Dye Concentrations, ppb								Low-Water Slack Dye Concentrations, ppb							
	Base		Plan 15		Plan 18		Plan 20		Base		Plan 15		Plan 18		Plan 20	
Cycle	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom
							Station MCB (Continued)									
10	898	--	660	--	741	--	373	--	898	--	398	--	663	--	392	--
12	918	--	818	--	781	--	406	--	1178	--	435	--	741	--	425	--
14	958	--	838	--	861	--	432	--	1473	--	453	--	761	--	418	--
16	1178	--	919	--	922	--	418	--	1768	--	472	--	902	--	418	--
							Station MCC									
1	18	--	84	--	128	--	114	--	0	--	0	--	0	--	0	--
2	164	--	506	--	151	--	170	--	7	--	83	--	5	--	11	--
3	170	--	525	--	411	--	229	--	47	--	187	--	16	--	32	--
4	200	--	544	--	490	--	296	--	109	--	204	--	142	--	39	--
5	261	--	621	--	702	--	436	--	358	--	246	--	321	--	77	--
6	409	--	640	--	741	--	625	--	702	--	265	--	624	--	81	--
8	515	--	660	--	741	--	842	--	779	--	352	--	781	--	161	--
10	664	--	679	--	882	--	842	--	819	--	411	--	801	--	229	--
12	721	--	838	--	963	--	802	--	878	--	418	--	861	--	253	--
14	878	--	858	--	983	--	944	--	1058	--	490	--	882	--	341	--
16	898	--	919	--	1147	--	964	--	1218	--	509	--	943	--	425	--
							Station MCD									
1	0	--	14	--	5	--	247	--	11	--	922	--	0	--	0	--
2	20	--	53	--	60	--	548	--	49	--	1787	--	67	--	72	--
3	323	--	86	--	71	--	703	--	230	--	1787	--	101	--	84	--
4	342	--	105	--	112	--	862	--	261	--	2002	--	216	--	153	--
5	341	--	153	--	158	--	903	--	273	--	2002	--	321	--	194	--
6	426	--	178	--	246	--	1045	--	336	--	2076	--	340	--	229	--
8	515	--	201	--	246	--	1066	--	497	--	2151	--	411	--	284	--
10	664	--	243	--	399	--	1086	--	570	--	2230	--	509	--	328	--
12	799	--	262	--	604	--	1107	--	760	--	2312	--	528	--	347	--
14	858	--	299	--	702	--	1148	--	878	--	2312	--	585	--	353	--
16	918	--	311	--	861	--	1189	--	938	--	2687	--	624	--	353	--
							Station MCE									
1	8	--	172	--	11	--	86	--	19	--	327	--	130	--	19	--
2	79	--	255	--	37	--	102	--	56	--	1248	--	153	--	147	--
3	426	--	268	--	80	--	114	--	106	--	1495	--	175	--	176	--
4	497	--	375	--	105	--	165	--	292	--	1570	--	265	--	211	--
5	533	--	360	--	140	--	182	--	298	--	1716	--	314	--	400	--
6	588	--	601	--	169	--	199	--	551	--	2076	--	327	--	418	--
8	607	--	640	--	193	--	223	--	588	--	2151	--	378	--	473	--
10	683	--	719	--	246	--	253	--	588	--	2151	--	547	--	548	--
12	741	--	738	--	289	--	259	--	741	--	2230	--	604	--	605	--
14	838	--	1082	--	302	--	290	--	838	--	2151	--	643	--	644	--
16	1158	--	1144	--	327	--	296	--	938	--	2312	--	509	--	903	--
							Station MCF									
1	0	--	48	--	14	--	20	--	1	--	78	--	210	--	0	--
2	212	--	80	--	32	--	57	--	47	--	147	--	398	--	79	--
3	298	--	100	--	78	--	114	--	144	--	252	--	509	--	176	--
4	336	--	107	--	85	--	153	--	279	--	378	--	566	--	194	--
5	533	--	125	--	114	--	199	--	394	--	381	--	585	--	247	--
6	760	--	130	--	152	--	211	--	479	--	490	--	585	--	373	--
8	878	--	161	--	187	--	272	--	588	--	547	--	682	--	382	--
10	938	--	195	--	234	--	284	--	721	--	566	--	722	--	400	--
12	1078	--	201	--	252	--	303	--	898	--	604	--	761	--	418	--
14	1198	--	237	--	271	--	322	--	998	--	643	--	781	--	436	--
16	2106	--	237	--	308	--	329	--	1078	--	702	--	841	--	454	--

(Continued)

Table 4 (Continued)

Cycle	High-Water Slack Dye Concentrations, ppb								Low-Water Slack Dye Concentrations, ppb							
	Base		Plan 15		Plan 18		Plan 20		Base		Plan 15		Plan 18		Plan 20	
	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom
								Station MCG								
1	49	--	7	--	5	--	14	--	409	--	352	--	682	--	567	--
2	182	--	30	--	47	--	55	--	878	--	722	--	722	--	964	--
3	261	--	95	--	71	--	88	--	918	--	781	--	801	--	1127	--
4	292	--	105	--	101	--	134	--	938	--	841	--	963	--	1168	--
5	304	--	132	--	140	--	159	--	1038	--	902	--	1004	--	1229	--
6	420	--	149	--	164	--	194	--	1058	--	943	--	1065	--	1229	--
8	409	--	195	--	222	--	235	--	1078	--	983	--	1126	--	1270	--
10	533	--	219	--	246	--	253	--	1138	--	1004	--	1228	--	1209	--
12	760	--	262	--	265	--	272	--	1278	--	1167	--	1269	--	1209	--
14	878	--	262	--	308	--	290	--	1318	--	1188	--	1310	--	1290	--
16	998	--	311	--	327	--	322	--	1473	--	1289	--	1570	--	1391	--
								Station MCH								
1	2	--	11	--	5	--	11	--	62	--	0	--	0	--	0	--
2	149	--	23	--	26	--	38	--	69	--	89	--	54	--	84	--
3	188	--	68	--	51	--	84	--	73	--	152	--	78	--	154	--
4	298	--	100	--	87	--	120	--	77	--	169	--	146	--	199	--
5	387	--	132	--	124	--	147	--	129	--	198	--	187	--	241	--
6	479	--	148	--	144	--	176	--	255	--	228	--	228	--	253	--
8	645	--	172	--	210	--	217	--	292	--	314	--	265	--	334	--
10	741	--	207	--	216	--	253	--	381	--	346	--	302	--	347	--
12	958	--	255	--	246	--	272	--	626	--	365	--	378	--	392	--
14	998	--	280	--	277	--	272	--	938	--	418	--	385	--	379	--
16	1118	--	280	--	283	--	290	--	1536	--	418	--	391	--	392	--
								Station MCK								
1	2	--	14	--	2	--	14	--	0	--	0	--	0	--	0	--
2	10	--	34	--	26	--	68	--	47	--	35	--	7	--	25	--
3	176	--	98	--	51	--	114	--	49	--	71	--	22	--	84	--
4	242	--	114	--	71	--	176	--	52	--	112	--	67	--	90	--
5	394	--	149	--	124	--	205	--	54	--	147	--	135	--	145	--
6	443	--	172	--	164	--	235	--	69	--	169	--	156	--	159	--
8	702	--	231	--	228	--	322	--	95	--	198	--	187	--	194	--
10	760	--	255	--	234	--	328	--	142	--	240	--	210	--	247	--
12	799	--	274	--	277	--	334	--	147	--	252	--	246	--	247	--
14	918	--	292	--	308	--	341	--	170	--	295	--	271	--	253	--
16	1098	--	318	--	315	--	373	--	188	--	308	--	283	--	278	--
								Station MCL								
1	75	--	525	--	345	--	294	--	0	--	0	--	0	--	0	--
2	324	--	699	--	490	--	418	--	9	--	71	--	16	--	26	--
3	626	--	738	--	509	--	418	--	21	--	149	--	16	--	75	--
4	664	--	980	--	528	--	529	--	31	--	193	--	71	--	97	--
5	683	--	1001	--	566	--	548	--	33	--	240	--	114	--	104	--
6	702	--	1021	--	643	--	664	--	45	--	289	--	147	--	120	--
8	760	--	1021	--	801	--	683	--	71	--	295	--	152	--	223	--
10	779	--	1021	--	821	--	822	--	109	--	314	--	158	--	241	--
12	858	--	1164	--	861	--	683	--	122	--	321	--	175	--	278	--
14	1118	--	1205	--	1106	--	802	--	140	--	359	--	198	--	284	--
16	1258	--	1286	--	1126	--	964	--	152	--	453	--	265	--	315	--
								Station MCM								
1	1336	--	161	--	18	--	145	--	0	--	0	--	0	--	0	--
2	1473	--	225	--	63	--	152	--	15	--	7	--	5	--	9	--
3	1597	--	325	--	94	--	223	--	21	--	33	--	15	--	31	--
4	1597	--	396	--	147	--	303	--	40	--	63	--	37	--	61	--
5	1655	--	450	--	193	--	309	--	43	--	80	--	96	--	72	--
6	1655	--	469	--	234	--	334	--	43	--	87	--	101	--	97	--
8	1655	--	506	--	283	--	347	--	71	--	156	--	149	--	120	--
10	1933	--	544	--	327	--	373	--	104	--	169	--	198	--	153	--

(Continued)

Table 4 (Concluded)

Cycle	High-Water Slack Dye Concentrations, ppb								Low-Water Slack Dye Concentrations, ppb							
	Base		Plan 15		Plan 18		Plan 20		Base		Plan 15		Plan 18		Plan 20	
	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom
	Station MCM															
12	2233	--	582	--	385	--	379	--	113	--	187	--	204	--	165	--
14	2301	--	601	--	418	--	373	--	136	--	204	--	210	--	170	--
16	2373	--	798	--	453	--	454	--	147	--	210	--	234	--	188	--
	Station MCN															
1	15	--	34	--	12	--	79	--	0	--	0	--	0	--	0	--
2	52	--	111	--	63	--	84	--	7	--	9	--	10	--	12	--
3	215	--	172	--	117	--	159	--	29	--	28	--	39	--	37	--
4	255	--	207	--	137	--	194	--	56	--	58	--	67	--	46	--
5	819	--	255	--	158	--	284	--	73	--	78	--	92	--	75	--
6	918	--	318	--	228	--	278	--	113	--	101	--	119	--	125	--
8	958	--	324	--	289	--	322	--	120	--	137	--	169	--	131	--
10	998	--	330	--	295	--	328	--	152	--	158	--	187	--	147	--
12	1038	--	415	--	340	--	341	--	194	--	169	--	228	--	159	--
14	1218	--	450	--	365	--	386	--	218	--	198	--	234	--	182	--
16	1258	--	469	--	398	--	386	--	292	--	216	--	246	--	199	--
	Station MCP															
1	0	--	396	--	246	--	176	--	0	--	0	--	0	--	0	--
2	6	--	450	--	333	--	418	--	3	--	13	--	16	--	10	--
3	34	--	525	--	391	--	436	--	71	--	38	--	25	--	24	--
4	39	--	525	--	643	--	529	--	106	--	67	--	56	--	55	--
5	75	--	563	--	682	--	625	--	224	--	76	--	71	--	134	--
6	91	--	582	--	702	--	605	--	230	--	114	--	137	--	84	--
8	136	--	621	--	741	--	703	--	236	--	133	--	169	--	95	--
10	152	--	640	--	821	--	742	--	236	--	158	--	193	--	108	--
12	182	--	719	--	841	--	842	--	391	--	175	--	216	--	119	--
14	188	--	858	--	861	--	923	--	461	--	181	--	228	--	176	--
16	255	--	1185	--	922	--	1209	--	479	--	193	--	258	--	182	--

Table 5

High- and Low-Water Slack Dye Concentrations

Mathews Bridge Release

	High-Water Slack Dye Concentrations, ppb								Low-Water Slack Dye Concentrations, ppb							
	Base		Plan 15		Plan 18		Plan 20		Base		Plan 15		Plan 18		Plan 20	
Cycle	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom
								Station - Sump								
1	0	--	0	--	0	--	0	--	1	--	0	--	0	--	0	--
2	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--
3	0	--	0	--	0	--	0	--	1	--	0	--	0	--	0	--
4	0	--	0	--	0	--	0	--	1	--	0	--	0	--	0	--
5	0	--	0	--	0	--	0	--	1	--	0	--	0	--	0	--
6	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--
8	0	--	0	--	0	--	0	--	1	--	0	--	0	--	0	--
10	0	--	0	--	0	--	0	--	1	--	0	--	0	--	0	--
12	1	--	0	--	1	--	0	--	1	--	0	--	0	--	0	--
14	2	--	1	--	2	--	1	--	2	--	1	--	1	--	1	--
16	3	--	2	--	1	--	3	--	3	--	3	--	1	--	3	--
								Station - Ocean								
1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
2	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0
3	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0
4	1	1	0	0	1	0	0	0	1	1	0	0	0	0	0	0
5	0	0	0	0	1	0	0	0	1	1	0	1	0	0	0	0
6	3	1	0	0	5	1	0	0	3	1	2	1	1	0	0	0
8	3	1	1	0	7	1	5	0	5	1	5	1	5	2	0	0
10	4	1	1	0	10	2	5	0	9	1	10	2	7	4	15	1
12	5	1	3	0	23	2	5	0	11	3	22	3	13	2	16	1
14	7	2	4	0	55	5	8	1	41	4	23	4	18	2	31	3
16	7	3	27	2	78	5	11	2	42	7	28	5	26	3	37	2
								Station OB								
1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	1	0	0	0	0	0	2	0	1	0	0	0	0	0
3	0	0	1	0	0	0	0	0	2	0	1	0	2	0	0	0
4	4	0	1	0	1	0	0	0	7	0	1	0	3	0	3	0
5	5	0	1	0	1	0	0	0	11	0	5	0	7	0	9	0
6	10	0	1	0	2	0	2	0	19	0	9	0	12	0	20	0
8	23	0	3	0	3	0	4	0	35	1	39	1	23	0	54	0
10	21	1	8	0	19	0	9	0	64	2	66	1	41	0	78	0
12	57	1	12	0	19	0	21	0	80	4	86	2	70	2	101	5
14	67	2	15	1	24	0	24	1	99	4	111	6	82	3	188	6
16	82	3	18	1	26	0	31	1	134	6	185	10	106	5	235	7
								Station 3A								
1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
2	0	0	0	0	0	0	0	0	0	1	4	0	0	0	0	0
3	2	0	1	0	0	0	0	0	3	1	7	0	2	1	2	0
4	6	1	1	0	0	0	0	0	9	4	7	1	6	3	8	3
5	12	2	2	1	1	1	2	0	17	12	13	5	11	7	20	9
6	20	2	4	1	3	0	[illegible]	0	24	18	22	14	19	11	35	20
8	49	3	17	3	6	1	13	2	54	32	59	38	32	23	73	52
10	59	4	27	4	11	2	32	3	81	58	80	65	61	42	111	78
12	67	6	37	6	21	3	37	5	95	73	122	85	77	65	212	109
14	88	8	58	9	31	4	54	9	114	86	208	115	102	80	236	189
16	104	11	90	13	40	7	62	12	187	106	244	197	174	101	283	212
								Station 5A								
1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
2	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0
3	3	0	2	0	1	0	0	0	7	1	3	1	3	0	4	0
4	7	1	4	0	3	0	4	0	16	1	8	3	8	1	13	1
5	12	1	7	1	6	0	10	0	23	3	17	6	18	2	26	4
6	17	2	15	2	9	0	20	1	33	4	28	15	23	5	50	11

(Continued)

(Sheet 1 of 8)

Table 5 (Continued)

Cycle	High-Water Slack Dye Concentrations, ppb: Base Surface	Base Bottom	Plan 15 Surface	Plan 15 Bottom	Plan 18 Surface	Plan 18 Bottom	Plan 20 Surface	Plan 20 Bottom	Low-Water Slack Dye Concentrations, ppb: Base Surface	Base Bottom	Plan 15 Surface	Plan 15 Bottom	Plan 18 Surface	Plan 18 Bottom	Plan 20 Surface	Plan 20 Bottom
									Station 5A (Continued)							
8	35	3	33	4	23	1	53	5	69	10	63	32	45	10	81	23
10	62	5	59	9	37	2	71	11	93	22	93	60	64	19	186	56
12	74	7	75	12	63	3	107	20	126	30	174	64	82	28	233	67
14	84	10	97	14	75	5	136	27	184	45	221	70	112	37	269	80
16	107	15	136	21	93	7	224	37	207	59	257	102	196	58	316	103
									Station 7B							
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	2	0	3	0	0	0	0	0	5	1	0	1	0	0	3	0
3	5	1	3	2	1	0	2	0	18	3	10	3	13	1	14	1
4	9	3	5	4	5	0	6	2	27	8	22	7	23	3	34	5
5	19	5	13	7	8	1	15	1	54	19	36	14	31	6	61	10
6	29	11	20	9	16	1	29	7	65	24	58	21	51	10	74	18
8	57	18	50	21	25	10	66	28	109	53	97	58	62	37	186	41
10	76	43	76	36	55	14	84	31	192	71	211	72	111	47	256	77
12	114	38	94	48	72	15	123	36	216	89	258	89	172	59	279	92
14	122	50	133	60	81	15	213	43	252	107	305	105	242	89	314	126
16	185	49	223	82	102	53	248	53	286	133	351	248	290	85	408	213
									Station 9AB							
1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	3	0	1	0	1	0	2	0	4	0	3	0	1	0	1	0
3	14	3	5	1	4	0	5	0	13	1	8	1	5	0	8	0
4	26	4	10	2	9	1	15	0	17	1	17	2	11	2	18	0
5	37	4	21	4	20	2	30	2	41	3	29	4	20	4	35	1
6	55	6	38	7	22	3	51	5	57	7	55	8	26	8	63	4
8	83	14	67	17	50	10	84	15	87	17	88	19	55	19	102	17
10	103	26	94	23	73	19	138	32	121	31	177	35	72	36	200	33
12	139	37	211	38	91	27	222	54	178	56	235	62	101	37	236	56
14	199	53	234	55	126	41	258	66	213	64	282	71	187	69	283	70
16	209	59	281	72	221	55	315	76	240	73	328	92	210	83	329	80
									Station 9B							
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	2	0	0	0	1	0	0	0	5	0	5	1	5	0	4	0
3	12	1	3	0	11	0	1	0	22	2	15	2	12	1	18	0
4	19	2	7	2	14	0	8	0	36	5	27	5	29	4	40	4
5	28	3	13	4	19	2	17	1	50	10	52	11	42	12	67	12
6	36	5	22	9	20	5	31	4	61	14	72	20	55	13	88	21
8	82	11	59	8	50	5	67	13	98	30	133	53	79	26	220	59
10	100	19	76	23	63	14	98	25	172	52	244	83	131	53	291	83
12	104	29	104	33	93	21	187	43	217	66	290	95	221	68	350	127
14	134	35	187	43	100	20	222	52	265	79	349	176	267	90	373	211
16	218	46	246	57	186	29	257	62	286	96	407	235	324	123	442	235
									Station 10A							
1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
2	3	0	2	0	3	0	2	0	3	1	5	1	4	0	4	0
3	10	1	6	2	8	0	11	0	16	6	16	3	10	1	19	1
4	18	3	11	4	19	1	29	0	29	13	36	7	28	3	40	6
5	28	7	24	4	33	2	51	2	46	21	52	15	39	10	65	13
6	44	15	52	14	32	4	60	6	60	27	68	23	55	13	92	24
8	74	16	70	19	50	11	182	18	94	61	130	61	83	35	222	65
10	94	27	93	31	80	16	253	32	139	83	234	77	134	59	281	88
12	167	44	188	47	112	29	288	55	200	90	304	120	233	73	351	175
14	176	49	223	54	193	44	323	67	247	117	351	175	279	97	386	223
16	222	58	283	71	229	53	357	72	282	169	398	231	325	126	444	258

(Continued)

Table 5 (Continued)

Cycle	High-Water Slack Dye Concentrations, ppb								Low-Water Slack Dye Concentrations, ppb							
	Base		Plan 15		Plan 18		Plan 20		Base		Plan 15		Plan 18		Plan 20	
	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom
								Station 11A								
1	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0
2	4	0	3	0	2	0	1	0	5	3	6	5	6	3	5	1
3	14	2	8	1	7	2	7	0	19	10	20	12	18	9	26	9
4	28	4	16	6	12	5	21	6	32	24	35	29	35	22	62	22
5	42	8	25	9	22	6	33	9	53	36	63	48	49	33	79	36
6	56	12	50	11	26	12	59	19	68	52	85	70	59	49	139	72
8	78	28	76	37	58	21	105	29	103	85	191	120	98	70	261	108
10	114	44	118	55	80	40	198	65	153	118	273	223	189	92	307	199
12	174	60	211	70	104	54	257	66	216	178	331	271	248	110	378	258
14	221	75	270	82	206	66	304	97	251	249	389	329	283	246	425	352
16	265	83	306	117	228	75	351	127	286	272	448	388	342	279	471	375
								Station 14A								
1	0	0	3	2	1	0	4	0	2	1	20	2	10	2	11	0
2	15	1	15	4	8	0	13	2	21	3	64	13	41	7	123	8
3	30	4	24	6	26	3	29	2	65	12	119	26	79	20	246	36
4	38	9	52	9	31	13	74	7	61	24	210	54	95	38	281	69
5	41	17	70	17	43	15	85	18	83	38	292	83	112	57	363	84
6	60	23	92	25	59	17	133	35	93	57	328	98	232	65	434	122
8	154	51	215	64	97	30	311	67	197	89	421	240	350	101	515	262
10	245	68	250	81	190	59	332	93	244	123	491	286	384	214	562	333
12	243	83	356	109	224	73	391	136	291	205	526	381	478	249	622	391
14	291	103	390	200	284	96	426	224	338	239	634	415	514	343	682	450
16	361	147	449	236	329	144	472	259	360	274	658	546	609	341	744	508
								Station 15A								
1	0	0	2	1	1	0	3	0	8	1	7	9	10	4	3	12
2	65	3	11	1	8	1	9	1	47	4	42	34	34	9	43	46
3	89	5	21	4	17	3	21	5	44	14	79	57	70	27	89	45
4	186	11	51	8	31	7	205	208	63	24	140	91	79	44	106	60
5	222	17	72	17	39	14	241	231	119	42	245	195	97	55	107	85
6	330	24	77	29	67	20	288	266	223	51	317	254	233	72	119	87
8	364	53	190	58	98	40	300	275	294	90	387	347	280	114	420	251
10	447	74	237	88	143	62	380	368	388	125	481	381	373	214	503	404
12	481	93	284	116	235	81	402	391	398	228	516	416	480	284	515	427
14	552	101	378	188	295	104	447	402	481	275	575	510	468	343	538	486
16	540	200	543	235	303	158	483	401	492	298	598	557	587	413	634	497
								Station 16A								
1	0	0	9	1	5	0	7	0	8	4	4	13	2	11	12	3
2	32	2	9	2	26	1	31	1	39	16	29	35	21	26	63	54
3	62	6	33	4	39	4	50	6	71	25	60	61	61	60	132	66
4	84	22	39	12	66	8	242	257	93	29	107	76	71	70	234	108
5	87	26	62	22	71	14	277	305	107	58	127	194	88	86	304	181
6	221	27	105	31	84	20	336	314	136	73	222	217	107	136	446	275
8	280	59	264	67	232	44	371	310	247	129	305	311	258	240	493	357
10	314	79	335	94	261	66	430	320	342	254	411	381	293	298	589	404
12	350	103	418	131	297	82	489	319	353	276	506	403	364	416	600	449
14	398	188	488	199	378	111	524	330	447	347	517	462	440	451	661	532
16	443	223	425	247	449	197	584	330	470	393	599	545	470	520	722	639
								Station 17A								
1	0	2	5	3	14	3	7	13	5	3	32	7	5	11	40	49
2	34	6	6	6	24	9	38	22	30	8	73	28	30	15	42	50
3	50	12	24	19	56	14	95	26	56	10	121	40	48	37	90	49
4	82	23	42	34	75	19	98	29	72	23	258	67	69	42	126	55
5	92	30	65	53	83	36	240	33	96	33	317	88	79	60	221	69
6	149	51	74	61	127	40	288	56	100	67	329	116	105	83	269	91
8	251	71	106	85	243	85	347	83	160	83	351	191	270	134	352	130
10	291	89	358	190	263	126	395	212	271	102	436	238	305	203	434	261

(Continued)

Table 5 (Continued)

	High-Water Slack Dye Concentrations, ppb								Low-Water Slack Dye Concentrations, ppb							
	Base		Plan 15		Plan 18		Plan 20		Base		Plan 15		Plan 18		Plan 20	
Cycle	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom
								Station 17A (Continued)								
12	362	131	416	200	334	130	500	295	318	179	459	279	340	262	458	295
14	431	212	439	236	406	211	533	330	341	226	530	367	387	260	517	354
16	431	235	510	295	479	282	592	377	353	285	650	390	423	354	552	425
								Station 18A								
1	6	1	7	5	6	2	10	2	4	2	27	11	25	13	38	5
2	25	4	21	7	17	6	41	3	35	9	52	26	45	17	103	28
3	37	13	20	19	32	11	72	7	45	12	101	27	91	61	187	33
4	63	26	78	28	61	25	87	26	71	30	147	56	104	62	211	37
5	71	38	100	50	67	33	119	37	79	43	223	56	111	65	319	57
6	96	55	131	63	89	36	241	57	101	67	247	113	259	89	342	86
8	149	77	276	98	216	70	324	88	144	88	366	123	342	192	390	191
10	242	107	322	177	251	90	405	189	211	132	448	226	365	202	460	249
12	288	201	369	236	296	130	452	236	259	240	472	273	448	273	472	296
14	335	236	474	271	331	222	511	295	295	274	483	343	448	320	591	354
16	346	271	498	318	413	257	558	342	306	310	543	378	459	414	639	402
								Station 20A								
1	20	3	24	5	33	8	12	16	10	21	73	54	35	66	88	70
2	45	7	43	15	49	15	113	30	44	65	78	61	35	70	223	187
3	75	32	89	31	94	32	198	45	51	101	138	187	100	211	307	199
4	117	34	139	55	105	48	234	68	75	167	271	199	67	223	331	271
5	153	57	257	80	126	65	317	96	76	259	295	271	97	246	343	294
6	282	74	292	101	281	79	399	192	114	366	331	271	135	425	366	341
8	317	113	362	216	339	130	433	251	136	401	354	342	259	436	390	413
10	364	204	432	286	386	225	551	333	259	436	425	436	390	447	544	495
12	398	239	466	320	479	260	575	379	283	483	437	460	401	519	628	495
14	457	286	537	379	491	319	610	427	295	491	484	483	425	518	616	566
16	480	321	586	486	573	377	659	485	413	541	520	578	472	518	763	614
								Station 24A								
1	75	77	13	34	36	40	56	93	0	0	0	0	0	0	0	0
2	61	98	23	48	59	85	147	223	9	27	14	26	20	27	20	25
3	83	284	61	74	79	135	271	271	9	35	21	54	27	40	48	82
4	93	284	223	222	90	198	295	342	23	49	23	62	39	59	62	97
5	139	366	271	294	133	258	377	448	23	66	43	77	59	71	85	199
6	236	402	282	329	258	389	437	495	23	88	52	121	62	77	103	223
8	271	413	341	411	306	459	424	542	31	100	74	187	91	211	199	295
10	330	543	424	493	341	470	507	614	48	126	79	271	104	235	247	342
12	366	554	459	565	447	553	542	662	56	259	115	306	123	282	283	378
14	437	565	483	588	435	600	650	773	66	271	123	342	130	318	330	425
16	448	625	518	624	494	624	686	810	85	271	223	389	159	318	366	448
								Station 28B								
1	4	44	10	38	14	38	5	70	1	0	0	0	0	0	0	0
2	5	62	24	55	41	62	62	82	0	6	0	1	0	1	0	0
3	58	82	27	115	70	82	73	211	0	10	0	5	0	3	0	6
4	61	118	35	133	82	100	74	235	1	21	0	9	0	6	0	14
5	65	212	46	235	86	144	84	331	1	26	0	9	0	10	2	25
6	80	248	47	247	211	259	124	354	2	40	1	20	1	20	5	32
8	92	283	62	294	247	294	223	413	3	35	2	32	2	23	7	94
10	128	307	74	377	271	306	306	496	8	65	5	40	4	31	14	105
12	147	342	366	413	366	413	330	519	8	72	8	65	4	42	19	187
14	283	389	366	472	401	436	449	555	8	80	9	75	4	59	24	187
16	318	437	377	483	413	471	460	591	12	86	13	103	10	62	32	235

(Continued)

Table 5 (Continued)

	High-Water Slack Dye Concentrations, ppb								Low-Water Slack Dye Concentrations, ppb							
	Base		Plan 15		Plan 18		Plan 20		Base		Plan 15		Plan 18		Plan 20	
Cycle	Sur-face	Bot-tom	Sur-face	Bot-tom	Sur-face	Bot-tom	Sur-face	Bot-tom	Sur-face	Bot-tom	Sur-face	Bot-tom	Sur-face	Bot-tom	Sur-face	Bot-tom
								Station 33A								
1	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0
2	1	2	0	0	0	0	0	0	1	2	0	0	0	0	0	0
3	1	2	0	0	0	0	0	4	1	2	0	0	0	0	0	0
4	1	8	0	1	0	0	0	9	1	2	0	0	0	0	0	0
5	1	9	0	3	0	0	0	11	1	2	0	0	0	0	0	0
6	2	16	0	6	0	1	0	19	1	3	0	0	0	0	0	1
8	2	27	0	11	0	2	1	54	1	3	0	0	0	0	0	2
10	2	32	1	23	0	4	8	62	1	4	0	2	0	0	0	5
12	3	34	3	28	1	8	12	80	2	7	0	4	0	1	0	8
14	5	58	5	31	3	11	18	90	2	11	0	7	0	1	2	15
16	6	66	7	46	4	27	25	111	3	20	1	10	0	3	2	18
								Station BRR								
1	1	--	4	--	1	--	27	--	0	--	0	--	0	--	0	--
2	2	--	7	--	11	--	35	--	0	--	1	--	0	--	1	--
3	18	--	35	--	34	--	41	--	8	--	3	--	1	--	7	--
4	18	--	37	--	47	--	78	--	10	--	10	--	4	--	11	--
5	44	--	97	--	46	--	104	--	56	--	42	--	12	--	19	--
6	46	--	110	--	62	--	127	--	64	--	44	--	17	--	83	--
8	94	--	219	--	93	--	231	--	74	--	81	--	63	--	116	--
10	196	--	254	--	102	--	290	--	97	--	143	--	194	--	207	--
12	207	--	359	--	253	--	372	--	207	--	289	--	218	--	325	--
14	231	--	500	--	323	--	419	--	241	--	324	--	264	--	407	--
16	279	--	583	--	358	--	478	--	313	--	430	--	276	--	466	--
								Station TRR								
1	10	--	34	--	11	--	14	--	13	--	14	--	29	--	21	--
2	32	--	48	--	32	--	59	--	56	--	28	--	52	--	105	--
3	44	--	103	--	61	--	97	--	75	--	55	--	81	--	211	--
4	76	--	223	--	77	--	141	--	109	--	83	--	123	--	271	--
5	90	--	246	--	91	--	222	--	153	--	186	--	210	--	330	--
6	124	--	318	--	125	--	294	--	235	--	246	--	294	--	389	--
8	258	--	400	--	328	--	342	--	306	--	293	--	423	--	459	--
10	294	--	518	--	363	--	470	--	341	--	351	--	434	--	565	--
12	340	--	528	--	421	--	481	--	376	--	433	--	564	--	589	--
14	387	--	600	--	456	--	505	--	435	--	492	--	576	--	637	--
16	410	--	636	--	551	--	504	--	458	--	515	--	660	--	697	--
								Station MCA								
1	0	0	0	0	0	0	0	0	0	0	6	2	4	1	1	0
2	0	0	1	0	2	1	2	0	0	0	10	2	8	3	3	0
3	11	16	4	2	12	2	6	6	12	2	14	6	9	11	16	4
4	50	24	10	7	18	6	18	6	11	8	20	13	16	14	29	15
5	30	21	21	8	26	8	41	10	25	17	26	18	28	20	35	28
6	30	30	31	18	37	19	46	21	8	29	42	35	41	30	59	51
8	46	51	66	40	50	33	92	49	24	50	75	67	63	49	88	74
10	77	72	93	64	71	57	184	73	28	54	160	126	95	66	187	179
12	151	77	127	82	111	73	220	91	145	109	205	204	182	155	262	249
14	186	119	208	97	206	81	256	124	157	141	250	234	242	190	332	304
16	218	179	290	147	242	158	325	213	191	191	284	295	302	243	366	375
								Station MCB								
1	0	--	2	--	3	--	0	--	0	--	1	--	0	--	0	--
2	2	--	7	--	9	--	5	--	0	--	0	--	1	--	1	--
3	3	--	19	--	16	--	19	--	0	--	5	--	9	--	3	--
4	17	--	29	--	25	--	41	--	1	--	14	--	13	--	13	--
5	24	--	38	--	35	--	64	--	1	--	24	--	23	--	23	--
6	27	--	52	--	30	--	88	--	5	--	43	--	35	--	56	--
8	39	--	89	--	51	--	217	--	10	--	83	--	43	--	88	--

(Continued)

Table 5 (Continued)

	High-Water Slack Dye Concentrations, ppb								Low-Water Slack Dye Concentrations, ppb							
	Base		Plan 15		Plan 18		Plan 20		Base		Plan 15		Plan 18		Plan 20	
Cycle	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom
							Station MCB (Continued)									
10	63	--	202	--	80	--	277	--	22	--	179	--	56	--	240	--
12	102	--	254	--	196	--	346	--	11	--	262	--	162	--	286	--
14	189	--	301	--	252	--	404	--	20	--	297	--	209	--	346	--
16	214	--	356	--	309	--	465	--	34	--	355	--	274	--	417	--
							Station MCC									
1	0	--	1	--	2	--	0	--	0	--	0	--	0	--	0	--
2	0	--	0	--	6	--	0	--	0	--	1	--	0	--	0	--
3	1	--	13	--	13	--	0	--	0	--	6	--	1	--	0	--
4	2	--	19	--	18	--	8	--	0	--	8	--	7	--	0	--
5	17	--	31	--	26	--	32	--	26	--	15	--	15	--	7	--
6	20	--	52	--	29	--	33	--	0	--	30	--	12	--	9	--
8	56	--	77	--	33	--	63	--	47	--	58	--	30	--	18	--
10	74	--	177	--	46	--	75	--	48	--	86	--	41	--	60	--
12	89	--	218	--	151	--	243	--	67	--	178	--	76	--	116	--
14	156	--	288	--	198	--	272	--	66	--	223	--	167	--	206	--
16	192	--	333	--	226	--	330	--	151	--	282	--	200	--	238	--
							Station MCD									
1	2	--	3	--	0	--	4	--	0	--	6	--	0	--	0	--
2	2	--	3	--	5	--	10	--	0	--	17	--	1	--	1	--
3	7	--	4	--	13	--	22	--	0	--	19	--	3	--	2	--
4	15	--	9	--	26	--	33	--	0	--	10	--	11	--	1	--
5	26	--	19	--	38	--	36	--	17	--	26	--	16	--	19	--
6	31	--	31	--	39	--	56	--	26	--	32	--	26	--	37	--
8	68	--	62	--	67	--	170	--	42	--	140	--	35	--	75	--
10	94	--	86	--	92	--	253	--	54	--	148	--	50	--	114	--
12	85	--	113	--	181	--	311	--	77	--	168	--	87	--	254	--
14	194	--	208	--	248	--	345	--	114	--	227	--	158	--	278	--
16	215	--	244	--	288	--	390	--	178	--	221	--	216	--	337	--
							Station MCE									
1	0	--	7	--	0	--	0	--	0	--	6	--	2	--	0	--
2	3	--	6	--	2	--	0	--	2	--	9	--	4	--	3	--
3	20	--	16	--	5	--	4	--	4	--	0	--	8	--	6	--
4	23	--	12	--	10	--	10	--	14	--	0	--	27	--	21	--
5	28	--	46	--	17	--	32	--	16	--	14	--	34	--	54	--
6	37	--	58	--	23	--	47	--	33	--	27	--	37	--	72	--
8	65	--	99	--	46	--	80	--	51	--	116	--	55	--	200	--
10	100	--	163	--	67	--	123	--	70	--	176	--	88	--	220	--
12	175	--	223	--	90	--	210	--	103	--	196	--	193	--	301	--
14	207	--	265	--	123	--	269	--	170	--	259	--	239	--	335	--
16	215	--	321	--	219	--	292	--	226	--	299	--	258	--	393	--
							Station MCF									
1	0	--	5	--	0	--	0	--	1	--	1	--	4	--	0	--
2	9	--	4	--	2	--	1	--	2	--	4	--	11	--	1	--
3	6	--	3	--	5	--	10	--	5	--	15	--	13	--	10	--
4	15	--	8	--	7	--	18	--	14	--	24	--	23	--	23	--
5	30	--	16	--	18	--	38	--	22	--	35	--	30	--	45	--
6	37	--	28	--	21	--	54	--	40	--	36	--	38	--	61	--
8	51	--	62	--	40	--	87	--	53	--	68	--	54	--	114	--
10	85	--	85	--	64	--	173	--	79	--	113	--	79	--	239	--
12	195	--	126	--	83	--	220	--	167	--	229	--	173	--	286	--
14	213	--	199	--	106	--	267	--	187	--	263	--	232	--	333	--
16	191	--	260	--	196	--	303	--	219	--	296	--	277	--	391	--

(Continued)

Table 5 (Continued)

	High-Water Slack Dye Concentrations, ppb								Low-Water Slack Dye Concentrations, ppb							
	Base		Plan 15		Plan 18		Plan 20		Base		Plan 15		Plan 18		Plan 20	
Cycle	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom
								Station MCG								
1	2	--	3	--	0	--	2	--	1	--	7	--	9	--	13	--
2	4	--	3	--	2	--	3	--	0	--	21	--	12	--	22	--
3	6	--	9	--	5	--	10	--	4	--	24	--	15	--	23	--
4	7	--	14	--	10	--	17	--	0	--	27	--	29	--	31	--
5	9	--	23	--	18	--	27	--	6	--	25	--	34	--	43	--
6	11	--	35	--	24	--	48	--	18	--	40	--	37	--	65	--
8	36	--	60	--	48	--	80	--	24	--	57	--	44	--	172	--
10	51	--	85	--	69	--	111	--	40	--	149	--	74	--	223	--
12	56	--	186	--	87	--	222	--	73	--	189	--	172	--	294	--
14	83	--	210	--	184	--	257	--	146	--	248	--	218	--	326	--
16	175	--	256	--	219	--	303	--	175	--	302	--	253	--	404	--
								Station MCH								
1	8	--	3	--	0	--	0	--	0	--	1	--	0	--	0	--
2	4	--	5	--	1	--	3	--	3	--	5	--	1	--	6	--
3	13	--	6	--	4	--	10	--	20	--	14	--	10	--	11	--
4	20	--	10	--	11	--	18	--	41	--	21	--	23	--	38	--
5	27	--	20	--	18	--	31	--	50	--	36	--	36	--	57	--
6	40	--	35	--	22	--	54	--	61	--	40	--	46	--	72	--
8	52	--	62	--	47	--	79	--	110	--	98	--	70	--	183	--
10	78	--	85	--	68	--	121	--	142	--	182	--	104	--	242	--
12	164	--	186	--	86	--	210	--	241	--	241	--	122	--	311	--
14	199	--	221	--	125	--	246	--	238	--	298	--	240	--	372	--
16	229	--	269	--	209	--	293	--	231	--	334	--	288	--	418	--
								Station MCK								
1	1	--	0	--	1	--	0	--	7	--	4	--	0	--	0	--
2	15	--	7	--	2	--	3	--	5	--	3	--	2	--	4	--
3	11	--	20	--	7	--	12	--	86	--	9	--	16	--	21	--
4	17	--	35	--	17	--	29	--	122	--	16	--	33	--	51	--
5	35	--	60	--	20	--	52	--	148	--	27	--	43	--	69	--
6	41	--	78	--	19	--	68	--	281	--	51	--	59	--	95	--
8	48	--	188	--	53	--	127	--	304	--	78	--	97	--	214	--
10	91	--	235	--	71	--	232	--	361	--	106	--	164	--	247	--
12	160	--	305	--	96	--	292	--	408	--	211	--	211	--	331	--
14	191	--	352	--	172	--	314	--	454	--	245	--	270	--	366	--
16	218	--	422	--	196	--	380	--	477	--	292	--	329	--	424	--
								Station MCL								
1	6	--	4	--	18	--	0	--	36	--	0	--	0	--	1	--
2	40	--	12	--	16	--	15	--	66	--	18	--	8	--	16	--
3	27	--	22	--	20	--	24	--	96	--	32	--	38	--	50	--
4	41	--	25	--	19	--	41	--	199	--	53	--	59	--	72	--
5	54	--	32	--	51	--	60	--	211	--	90	--	64	--	182	--
6	55	--	43	--	38	--	65	--	318	--	116	--	72	--	229	--
8	186	--	136	--	48	--	165	--	364	--	257	--	179	--	284	--
10	209	--	268	--	103	--	242	--	422	--	327	--	215	--	355	--
12	230	--	249	--	168	--	309	--	445	--	363	--	299	--	436	--
14	276	--	295	--	216	--	339	--	527	--	456	--	381	--	471	--
16	293	--	350	--	251	--	402	--	550	--	499	--	437	--	470	--
								Station MCM								
1	18	--	8	--	0	--	6	--	25	--	4	--	5	--	0	--
2	12	--	2	--	3	--	6	--	69	--	23	--	15	--	24	--
3	13	--	20	--	10	--	16	--	93	--	40	--	49	--	58	--
4	18	--	26	--	17	--	37	--	106	--	70	--	54	--	78	--
5	34	--	40	--	28	--	58	--	210	--	120	--	65	--	183	--
6	44	--	48	--	44	--	67	--	282	--	219	--	92	--	231	--
8	65	--	72	--	63	--	170	--	340	--	335	--	228	--	432	--

(Continued)

Table 5 (Concluded)

Cycle	High-Water Slack Dye Concentrations, ppb								Low-Water Slack Dye Concentrations, ppb							
	Base		Plan 15		Plan 18		Plan 20		Base		Plan 15		Plan 18		Plan 20	
	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom
Station MCM (Continued)																
10	140	--	184	--	92	--	229	--	398	--	394	--	238	--	395	--
12	161	--	242	--	168	--	300	--	433	--	512	--	309	--	537	--
14	217	--	277	--	215	--	336	--	492	--	511	--	344	--	561	--
16	225	--	339	--	249	--	403	--	491	--	535	--	414	--	620	--
Station MCN																
1	2	--	2	--	0	--	4	--	4	--	10	--	1	--	4	--
2	6	--	5	--	2	--	4	--	20	--	42	--	17	--	31	--
3	17	--	9	--	9	--	15	--	59	--	78	--	36	--	83	--
4	24	--	16	--	17	--	31	--	59	--	96	--	42	--	129	--
5	30	--	31	--	22	--	67	--	101	--	106	--	58	--	208	--
6	38	--	38	--	42	--	127	--	195	--	278	--	73	--	217	--
8	61	--	77	--	57	--	171	--	254	--	300	--	166	--	360	--
10	138	--	171	--	78	--	219	--	313	--	430	--	214	--	442	--
12	185	--	215	--	124	--	290	--	346	--	453	--	236	--	466	--
14	235	--	285	--	181	--	347	--	392	--	511	--	331	--	512	--
16	257	--	320	--	203	--	395	--	412	--	558	--	461	--	619	--
Station MCP																
1	3	--	12	--	6	--	5	--	67	--	2	--	1	--	1	--
2	19	--	14	--	11	--	0	--	70	--	18	--	12	--	36	--
3	33	--	19	--	17	--	22	--	68	--	33	--	34	--	77	--
4	53	--	36	--	29	--	36	--	70	--	71	--	55	--	92	--
5	64	--	45	--	40	--	37	--	66	--	114	--	74	--	117	--
6	84	--	52	--	43	--	193	--	67	--	193	--	81	--	134	--
8	133	--	105	--	57	--	188	--	139	--	277	--	227	--	576	--
10	253	--	203	--	130	--	330	--	296	--	359	--	238	--	636	--
12	299	--	259	--	193	--	313	--	301	--	405	--	308	--	660	--
14	358	--	300	--	276	--	380	--	345	--	453	--	355	--	669	--
16	355	--	343	--	285	--	425	--	368	--	559	--	425	--	681	--

(Sheet 8 of 8)

Table 6

Dye Concentrations Averaged over Test Period (16 Cycles, ppb)

Station	High-Water Slack												Low-Water Slack											
	Base			Plan 15			Plan 18			Plan 20			Base			Plan 15			Plan 18			Plan 20		
	Surface	Bottom	Depth-Average	Surface	Bottom	Depth-Average	Surface	Bottom	Depth-Average	Surface	Bottom	Depth-Average	Surface	Bottom	Depth-Average	Surface	Bottom	Depth-Average	Surface	Bottom	Depth-Average	Surface	Bottom	Depth-Average
Mill Cove Release Channel Stations																								
OB	74	3	39	31	2	17	26	0	13	18	2	10	126	5	66	101	5	53	104	3	54	115	4	60
3A	99	11	55	50	12	31	35	8	22	40	8	24	125	112	119	129	110	120	117	99	108	121	106	64
5A	108	11	60	91	17	54	86	7	47	102	18	60	174	42	108	144	88	116	162	49	106	163	67	115
7B	145	43	94	114	52	83	109	32	71	110	35	73	268	120	194	150	102	126	188	108	148	204	96	150
9B	201	36	119	127	36	82	132	62	97	139	40	90	242	88	165	206	111	159	185	114	150	222	116	169
10A	247	51	149	139	57	98	232	52	142	257	52	155	125	131	128	184	213	199	175	104	140	193	121	157
11A	195	72	134	142	82	112	189	76	133	172	85	129	96	112	104	144	167	156	137	156	147	142	160	151
14A	60	120	90	132	121	127	129	121	125	126	119	123	57	82	70	76	121	99	74	119	97	74	122	98
15A	60	121	91	146	119	133	138	122	130	139	114	127	49	86	68	60	120	90	58	118	88	66	114	90
16A	74	125	100	123	126	125	102	128	115	102	113	108	33	87	60	37	128	83	41	117	79	44	134	87
17A	67	126	97	126	125	126	97	133	115	136	135	136	24	100	62	38	121	80	35	116	76	34	125	80
18A	87	125	106	143	142	143	131	143	137	130	147	139	17	93	55	19	126	73	20	114	67	18	133	76
20A	53	101	77	77	129	103	67	119	93	74	142	108	14	47	31	12	22	17	12	31	22	13	29	21
24A	24	44	34	26	47	37	29	37	33	34	48	41	6	11	9	4	12	8	6	11	9	8	11	10
28B	14	21	18	9	19	14	13	19	16	10	19	15	0	7	4	0	3	2	0	2	1	0	4	2
33A	0	2	1	0	1	0	0	0	0	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0
BRR	45	--	45	86	--	80	70	--	70	82	--	82	49	--	49	56	--	56	53	--	53	56	--	56
TRR	37	--	37	47	--	47	47	--	47	40	--	40	39	--	39	47	--	47	49	--	49	44	--	44
Sump	3	--	3	2	--	2	1	--	1	2	--	2	3	--	3	2	--	2	1	--	1	2	--	2
Ocean	8	4	6	6	1	3	20	3	11	7	1	4	31	5	18	19	4	11	39	5	22	17	4	10
Mill Cove Stations																								
MCA	580	302	441	172	119	145	369	209	289	214	110	162	1029	517	773	365	382	374	481	497	489	610	307	458
MCB	837	--	837	606	--	606	619	--	619	283	--	283	623	--	623	270	--	270	469	--	469	266	--	266
MCC	445	--	445	625	--	625	667	--	667	569	--	569	543	--	543	288	--	288	489	--	489	150	--	150
MCD	473	--	473	173	--	173	315	--	315	900	--	900	437	--	437	2024	--	2024	337	--	337	218	--	218
MCE	560	--	560	578	--	578	173	--	173	197	--	197	456	--	456	1766	--	1766	363	--	363	413	--	413
MCF	758	--	758	147	--	147	157	--	157	206	--	206	515	--	515	435	--	435	604	--	604	287	--	287
MCG	462	--	462	161	--	161	172	--	172	183	--	183	1048	--	1048	925	--	925	1067	--	1067	1150	--	1150
MCH	542	--	542	152	--	152	152	--	152	171	--	171	403	--	403	245	--	245	219	--	219	252	--	252
MCK	504	--	504	177	--	177	164	--	164	228	--	228	92	--	92	166	--	166	144	--	144	157	--	157
MCL	713	--	713	969	--	969	709	--	709	620	--	620	67	--	67	244	--	244	119	--	119	160	--	160
MCM	1801	--	1801	460	--	460	238	--	238	308	--	308	67	--	67	109	--	109	114	--	114	97	--	97
MCN	703	--	703	280	--	280	218	--	218	258	--	258	114	--	114	105	--	105	126	--	126	101	--	101
MCP	105	--	105	642	--	642	653	--	653	655	--	655	222	--	222	104	--	104	124	--	124	90	--	90
Mathews Bridge Release Channel Stations																								
OB	24	1	13	6	0	3	9	0	5	8	0	4	41	2	22	46	2	24	31	1	16	63	2	33
3A	37	3	20	22	3	13	10	2	6	19	3	11	53	36	45	70	47	59	44	31	38	89	61	75
5A	36	4	20	39	6	23	28	2	15	57	9	33	69	16	43	79	32	56	50	15	33	107	31	69
7B	56	20	38	56	24	40	33	10	22	71	18	45	111	46	79	123	56	90	90	31	61	148	53	101
9B	67	14	41	65	16	41	51	9	30	81	18	50	110	33	72	145	62	104	106	35	71	172	68	120
10A	76	20	48	87	22	55	69	15	42	141	23	82	102	56	79	145	65	105	108	38	73	173	78	126

(Continued)

Table 6 (Concluded)

High-Water Slack

	Base			Plan 15			Plan 18			Plan 20		
Station	Surface	Bottom	Depth-Average	Surface	Bottom	Depth-Average	Surface	Bottom	Depth-Average	Surface	Bottom	Depth-Average
11A	91	29	60	99	35	67	68	26	47	121	38	80
14A	134	46	90	174	68	121	117	41	79	206	77	142
15A	298	53	176	170	68	119	112	45	79	253	232	243
16A	206	67	137	199	65	132	173	50	112	304	227	266
17A	198	78	138	186	107	147	191	87	139	281	134	208
18A	151	94	123	209	116	163	162	80	121	256	117	187
20A	246	125	186	294	179	237	269	142	206	373	211	292
24A	231	377	304	282	335	309	243	346	295	399	479	439
28B	113	229	171	130	260	195	200	237	218	199	351	275
33A	2	23	13	1	14	8	1	5	3	6	40	23
BRR	103	--	103	200	--	200	121	--	121	200	--	200
TRR	187	--	187	332	--	332	229	--	229	284	--	284
Sump	1	--	1	0	--	0	0	--	0	0	--	0
Ocean	3	1	2	3	0	2	17	1	9	3	0	1
Mill Cove Stations												
MCA	73	54	64	77	42	60	70	40	55	108	54	81
MCB	62	--	62	123	--	123	91	--	91	175	--	175
MCC	55	--	55	110	--	110	68	--	68	96	--	96
MCD	67	--	67	71	--	71	91	--	91	148	--	148
MCE	79	--	79	111	--	111	55	--	55	97	--	97
MCF	76	--	76	72	--	72	49	--	49	106	--	106
MCG	40	--	40	80	--	80	61	--	61	98	--	98
MCH	76	--	76	82	--	82	54	--	54	97	--	97
MCK	75	--	75	155	--	155	59	--	59	137	--	137
MCL	129	--	129	131	--	131	86	--	86	151	--	151
MCM	86	--	86	114	--	114	81	--	81	148	--	148
MCN	90	--	90	106	--	106	67	--	67	152	--	152
MCP	150	--	150	126	--	126	99	--	99	175	--	175

Low-Water Slack

	Base			Plan 15			Plan 18			Plan 20		
Station	Surface	Bottom	Depth-Average	Surface	Bottom	Depth-Average	Surface	Bottom	Depth-Average	Surface	Bottom	Depth-Average
11A	108	93	101	167	136	152	121	83	102	196	130	163
14A	160	97	129	342	195	269	264	131	198	417	206	312
15A	232	105	169	308	259	284	246	144	195	280	218	249
16A	210	146	178	262	245	254	198	210	204	387	279	333
17A	164	93	129	323	167	245	187	133	160	282	166	224
18A	141	110	126	283	148	216	245	155	200	341	158	250
20A	160	303	232	310	305	308	220	334	277	418	357	388
24A	34	117	76	70	167	119	74	149	112	158	229	194
28B	4	40	22	3	33	18	2	23	13	9	80	45
33A	1	5	3	0	2	1	0	0	0	0	4	2
BRR	97	--	97	124	--	124	95	--	95	149	--	149
TRR	232	--	232	245	--	245	313	--	313	389	--	389
Sump	1	--	1	0	--	0	0	--	0	0	--	0
Ocean	10	2	6	8	2	5	6	1	3	9	1	5
Mill Cove Stations												
MCA	55	55	55	99	91	95	90	71	80	125	116	120
MCB	9	--	9	115	--	115	75	--	75	134	--	134
MCC	37	--	37	81	--	81	50	--	50	59	--	59
MCD	46	--	46	92	--	92	55	--	55	102	--	102
MCE	64	--	64	100	--	100	87	--	87	146	--	146
MCF	72	--	72	99	--	99	85	--	85	137	--	137
MCG	44	--	44	99	--	99	82	--	82	147	--	147
MCH	103	--	103	115	--	115	85	--	85	155	--	155
MCK	241	--	241	95	--	95	111	--	111	166	--	166
MCL	294	--	294	201	--	201	159	--	159	233	--	233
MCM	259	--	259	251	--	251	165	--	165	284	--	284
MCN	196	--	196	260	--	260	149	--	149	279	--	279
MCP	169	--	169	226	--	226	165	--	165	334	--	334

Table 7

Mill Cove Channel Shoaling Tests

Shoaling Index*

Section No.	Base Volume of Material Retrieved cc	Base Shoaling Index	Plan 15 Volume of Material Retrieved cc	Plan 15 Shoaling Index	Plan 18 Volume of Material Retrieved cc	Plan 18 Shoaling Index	Plan 20 Volume of Material Retrieved cc	Plan 20 Shoaling Index
				Reach B				
27	35	0.3	110	1.0	140	1.3	185	1.8
28	610	5.8	690	6.6	615	5.8	815	7.8
29	490	4.7	370	3.5	445	4.2	385	3.6
30	25	0.2	5	0.0	45	0.4	10	0.1
31	15	0.1	80	0.8	140	1.3	130	1.2
32	2,615	24.8	2,145	20.4	2,520	23.9	2,290	21.7
33	1,215	11.6	1,245	11.8	1,160	11.1	1,210	11.5
34	790	7.5	1,170	11.1	1,090	10.4	970	9.2
35	630	6.0	830	7.9	515	4.9	550	5.2
36	1,405	13.4	1,450	13.8	1,360	12.9	1,600	15.2
37	2,045	19.4	1,790	17.0	1,950	18.5	1,980	18.8
38	655	6.2	800	7.6	795	7.6	975	9.3
Total	10,530	100.0	10,685	101.5	10,775	102.3	11,100	105.4
				Reach C				
39	1,220	6.3	815	4.0	790	4.1	925	4.8
40	1,770	9.1	1,750	9.0	2,155	11.1	1,885	9.7
41	1,900	9.8	1,760	9.1	1,485	7.7	1,595	8.2
42	2,060	10.6	1,810	9.3	1,790	9.2	1,915	9.9
43	910	4.7	990	5.1	1,395	7.2	975	5.0
44	955	4.9	950	4.9	890	4.6	895	4.6
45	170	0.9	145	0.7	70	0.4	210	1.1
46	1,615	8.3	1,385	7.1	1,020	5.2	1,155	6.0
47	965	5.0	2,035	10.5	1,690	8.7	2,370	12.2
48	1,575	8.1	1,720	8.9	2,095	10.8	1,395	7.2
49	950	4.9	345	1.8	655	3.4	610	3.1
50	75	0.4	5	0.0	30	0.1	5	0.0
51	410	2.1	10	0.1	15	0.1	25	0.1
52	290	1.5	175	0.9	175	0.9	190	1.0
53	510	2.6	555	2.9	570	2.9	545	2.8
54	695	3.6	790	4.1	675	3.5	855	4.4
55	970	5.0	635	3.3	690	3.5	660	3.4
56	565	2.9	600	3.1	590	3.0	660	3.4
57	1,015	5.3	670	3.5	575	3.0	650	3.3
58	785	4.0	915	4.7	720	3.7	910	4.7
59	0	0.0	95	0.4	440	2.3	205	1.1
Total	19,405	100.0	18,155	93.6	18,515	95.4	18,635	96.0
				Reach D				
60	40	0.6	575	9.3	750	12.1	465	7.5
61	215	3.5	590	9.5	635	10.2	650	10.5
62	480	7.7	450	7.3	400	6.5	545	8.8
63	1,685	27.2	750	12.1	910	14.7	740	11.9
64	1,045	16.9	1,150	18.6	1,070	17.2	1,355	21.9
65	980	15.8	740	11.9	780	12.6	825	13.3
66	202	3.3	790	12.7	795	12.8	650	10.5
67	185	3.0	100	1.6	30	0.5	30	0.5
68	880	14.2	240	3.9	115	1.9	180	2.9
69	330	5.3	855	13.8	700	11.3	800	12.9
70	155	2.5	245	3.9	305	4.9	295	4.8
Total	6,197	100.0	6,485	104.6	6,490	104.7	6,535	105.5

(Continued)

* Shoaling index is the total amount of material recovered for a plan test divided by the total amount of material recovered for the base test.

(Sheet 1 of 3)

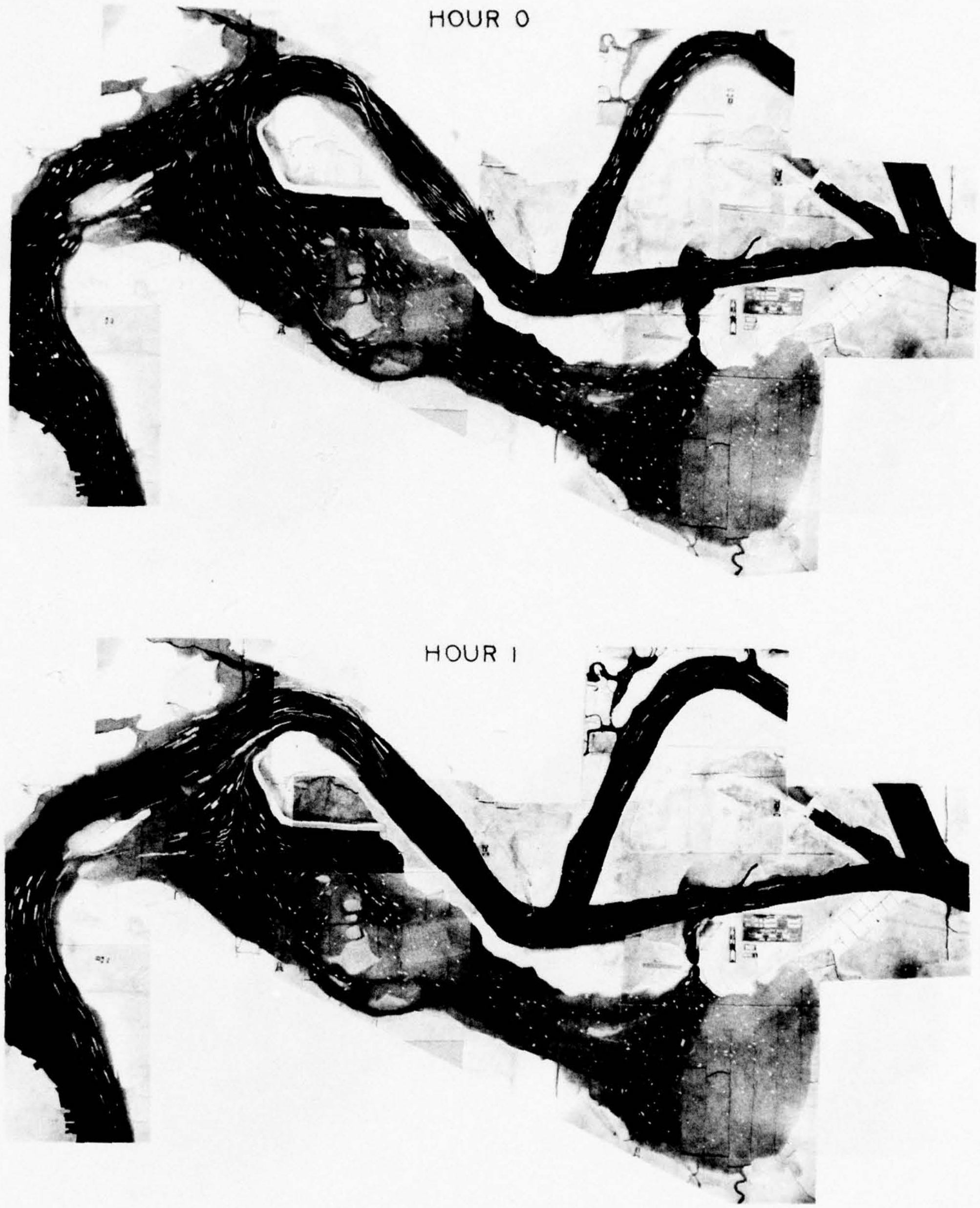
Table 7 (Continued)

Section No.	Base Volume of Material Retrieved cc	Base Shoaling Index	Plan 15 Volume of Material Retrieved cc	Plan 15 Shoaling Index	Plan 18 Volume of Material Retrieved cc	Plan 18 Shoaling Index	Plan 20 Volume of Material Retrieved cc	Plan 20 Shoaling Index
				Reach E				
71	85	0.9	20	0.2	15	0.2	15	0.2
72	1,865	19.0	0	0.0	210	2.1	0	0.0
73	3,660	37.2	2,100	21.4	2,130	21.7	1,600	16.3
74	890	9.0	3,580	36.4	3,870	39.4	4,065	41.4
75	320	3.2	875	8.9	1,165	11.9	930	9.5
76	805	8.2	605	6.2	770	7.8	820	8.3
77	55	0.6	130	1.3	150	1.5	110	1.1
78	135	1.4	80	0.8	415	4.2	140	1.4
79	445	4.5	415	4.2	305	3.1	460	4.7
80	315	3.2	195	2.0	145	1.5	175	1.8
81	520	5.3	480	4.9	445	4.5	505	5.1
82	305	3.1	265	2.7	245	2.5	250	2.5
83	205	2.1	130	1.3	165	1.7	170	1.7
84	38	0.4	220	2.2	170	1.7	180	1.8
85	785	1.9	440	4.5	475	4.8	440	4.5
Total	9,828	100.0	9,535	97.0	10,675	108.6	9,860	100.3
				Reach F				
86	205	6.0	235	6.8	410	11.9	410	11.9
87	485	14.1	410	11.9	505	14.7	470	13.7
88	420	12.2	390	11.4	450	13.1	310	9.0
89	385	11.2	430	12.5	380	11.1	690	20.1
90	365	10.6	315	9.2	340	9.9	265	7.7
91	150	4.4	70	2.0	140	4.1	30	0.9
92	30	0.9	10	0.3	110	3.2	5	0.2
93	430	12.5	275	8.0	290	8.4	220	6.4
94	305	8.9	560	16.3	500	14.5	540	15.7
95	115	3.3	220	6.4	130	3.8	125	3.6
96	220	6.4	60	1.8	20	0.6	90	2.6
97	215	6.3	175	5.1	100	2.9	165	4.8
98	55	1.6	35	1.0	130	3.8	50	1.5
99	55	1.6	45	1.3	110	3.2	25	0.7
Total	3,435	100.0	3,230	94.0	3,615	105.2	3,395	98.8
				Reach G				
100	20	1.9	55	5.3	17	1.7	25	2.4
101	45	4.4	60	5.8	13	1.3	30	2.9
102	60	5.8	170	16.5	100	9.7	135	13.1
103	115	11.1	250	24.2	150	14.5	220	21.3
104	120	11.6	170	16.5	200	19.4	215	20.8
105	87	8.4	60	5.8	55	5.3	45	4.4
106	160	15.5	160	15.5	110	10.7	160	15.5
107	68	6.6	60	5.8	40	3.9	25	2.4
108	60	5.8	80	7.8	60	5.8	60	5.8
109	55	5.3	30	2.9	50	4.8	35	3.4
110	50	4.9	25	2.4	32	3.1	30	2.9
111	45	4.4	25	2.4	28	2.7	30	2.9
112	30	2.9	20	1.9	25	2.4	15	1.5
113	5	0.5	0	0.0	25	2.4	5	0.5
114	50	4.9	25	2.4	55	5.3	30	2.9
115	62	6.0	50	4.9	50	4.8	15	1.5
116	0	0.0	0	0.0	0	0.0	0	0.0
117	0	0.0	0	0.0	0	0.0	0	0.0
Total	1,032	100.0	1,240	120.1	1,010	97.8	1,075	104.2

(Continued)

Table 7 (Concluded)

Section No.	Base: Volume of Material Retrieved cc	Base: Shoaling Index	Plan 15: Volume of Material Retrieved cc	Plan 15: Shoaling Index	Plan 18: Volume of Material Retrieved cc	Plan 18: Shoaling Index	Plan 20: Volume of Material Retrieved cc	Plan 20: Shoaling Index
				Reach H				
1	270	3.1	125	1.4	160	1.8	125	1.4
2	285	3.3	215	2.5	365	4.2	285	3.3
3	355	4.1	295	3.4	315	3.6	305	3.5
4	230	2.6	250	2.9	205	2.4	185	2.1
5	345	4.0	485	5.6	400	4.6	510	5.9
6	465	5.3	340	3.9	245	2.8	280	3.2
7	325	3.7	310	3.6	280	3.2	215	2.5
8	385	4.4	360	4.1	295	3.4	300	3.4
9	320	3.7	360	4.1	310	3.6	440	5.1
10	460	5.3	365	4.2	340	3.9	450	5.2
11	345	4.0	225	2.6	220	2.5	260	3.0
12	495	5.7	375	4.3	230	2.6	365	4.2
13	385	4.4	460	5.3	375	4.3	430	4.9
14	395	4.5	350	4.0	355	4.1	385	4.4
15	395	4.5	380	4.4	485	5.6	415	4.8
16	325	3.7	455	5.2	365	4.2	375	4.3
17	240	2.8	335	3.8	190	2.2	315	3.6
18	215	2.5	315	3.6	300	3.4	225	2.6
19	245	2.8	320	3.7	315	3.6	325	3.7
20	395	4.5	295	3.4	425	4.9	315	3.6
21	460	5.3	225	2.6	370	4.3	395	4.5
22	280	3.2	310	3.5	265	3.0	415	4.8
23	395	4.5	380	4.4	335	3.9	320	3.7
24	345	4.0	360	4.1	350	4.0	365	4.2
25	285	3.3	220	2.5	55	0.6	135	1.5
26	70	0.8	0	0.0	0	0.0	0	0.0
Total	8,710	100.0	8,110	93.1	7,550	86.7	8,135	93.4



VELOCITY SCALE
5 0 5 10 15
FPS PROTOTYPE

MILL COVE STUDY
SURFACE CURRENT PATTERNS
BASE
HOURS 0 AND 1

PHOTO 1

HOUR 2

HOUR 3

VELOCITY SCALE

5 0 5 10 15

FPS PROTOTYPE

MILL COVE STUDY

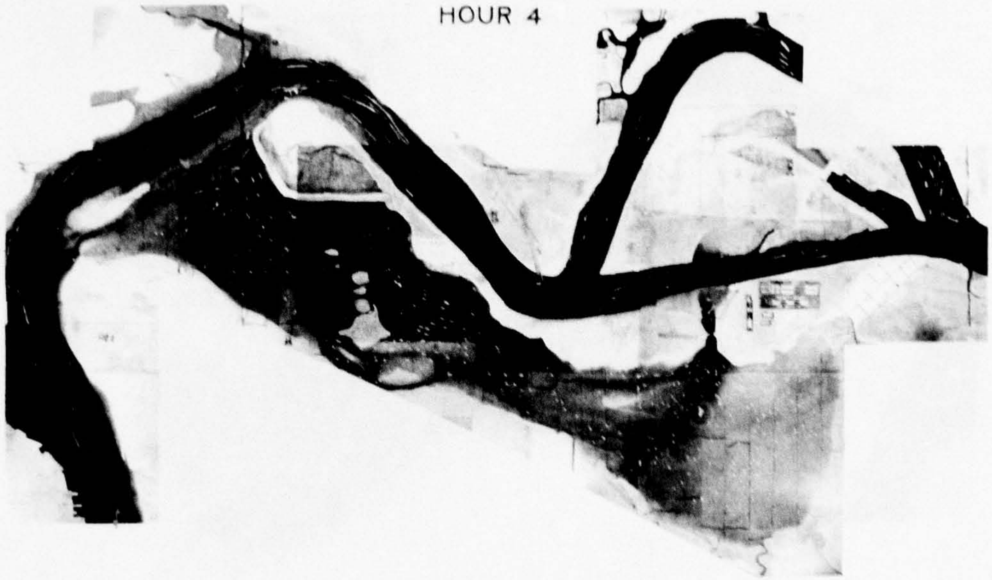
SURFACE CURRENT PATTERNS

BASE

HOURS 2 AND 3

PHOTO 2

HOUR 4



HOUR 5

VELOCITY SCALE

5 0 5 10 15

FPS PROTOTYPE

MILL COVE STUDY

SURFACE CURRENT PATTERNS

BASE

HOURS 4 AND 5

PHOTO 3

HOUR 6

HOUR 7

VELOCITY SCALE
5 0 5 10 15
FPS PROTOTYPE

MILL COVE STUDY

SURFACE CURRENT PATTERNS

BASE

HOURS 6 AND 7

PHOTO 4

HOUR 8

HOUR 9

VELOCITY SCALE
5 0 5 10 15
FPS PROTOTYPE

MILL COVE STUDY

SURFACE CURRENT PATTERNS

BASE

HOURS 8 AND 9

PHOTO 5

HOUR 10

HOUR 11

VELOCITY SCALE
5 0 5 10 15
FPS PROTOTYPE

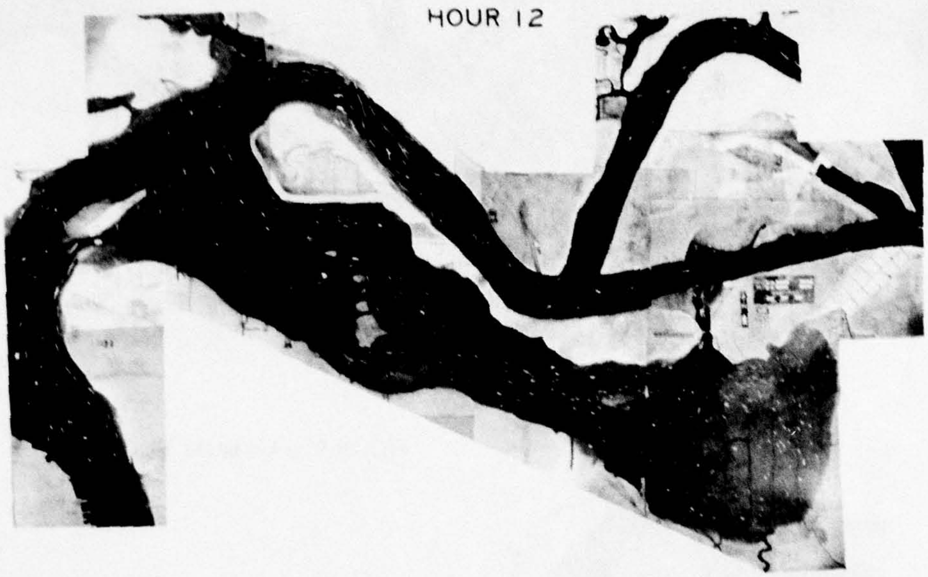
MILL COVE STUDY

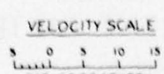
SURFACE CURRENT PATTERNS

BASE

HOURS 10 AND 11

PHOTO 6





MILL COVE STUDY

SURFACE CURRENT PATTERNS

BASE

HOUR 12

PHOTO 7

VELOCITY SCALE
5 0 5 10 15
FPS PROTOTYPE

MILL COVE STUDY
SURFACE CURRENT PATTERNS
PLAN 1
HOURS 2 AND 9

PHOTO 8

HOUR 2 MAXIMUM EBB

HOUR 9 MAXIMUM FLOOD

VELOCITY SCALE
5 0 5 10 15
FPS PROTOTYPE

MILL COVE STUDY

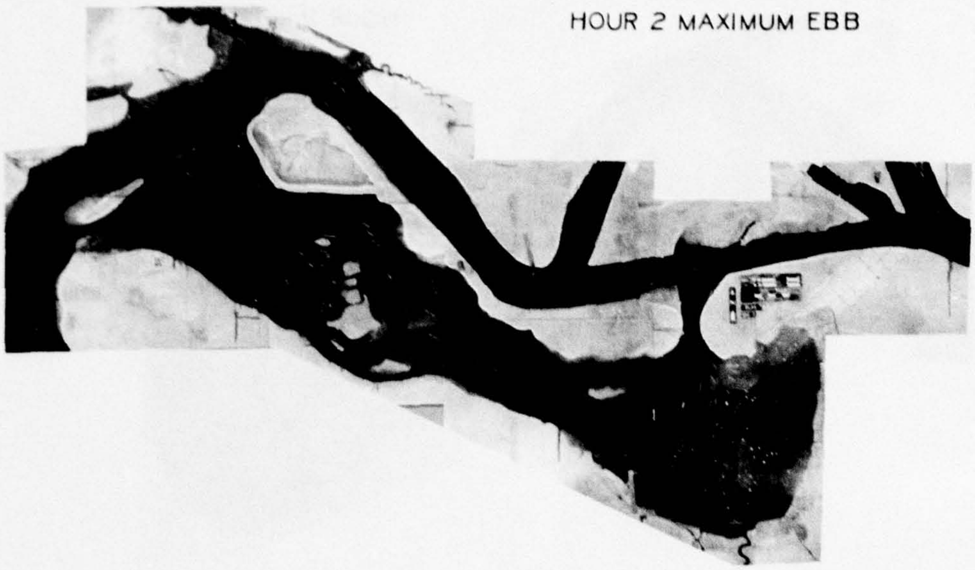
SURFACE CURRENT PATTERNS

PLAN 2

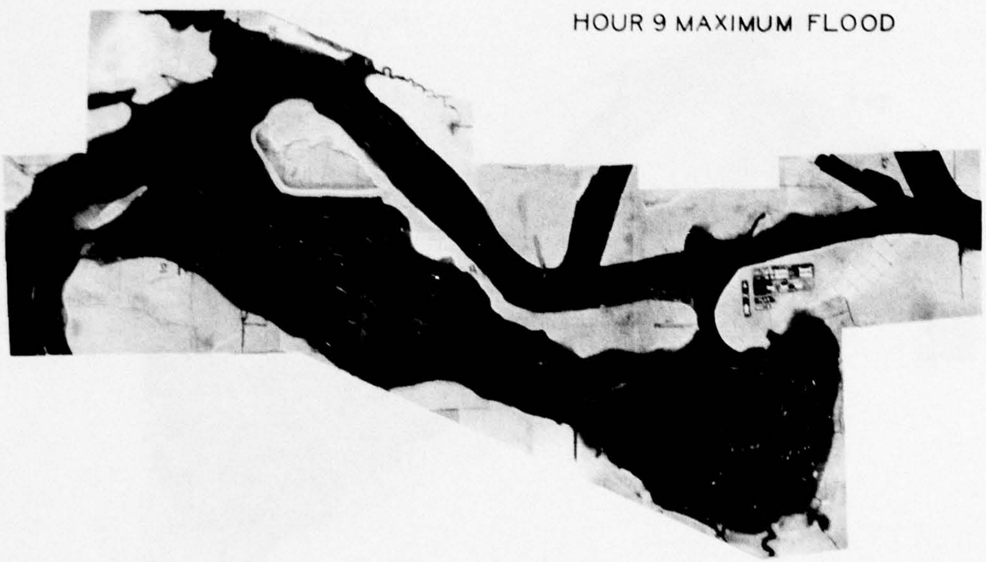
HOURS 2 AND 9

PHOTO 9

HOUR 2 MAXIMUM EBB



HOUR 9 MAXIMUM FLOOD



VELOCITY SCALE

5 0 5 10 15

FPS PROTOTYPE

MILL COVE STUDY

SURFACE CURRENT PATTERNS

PLAN 3

HOURS 2 AND 9

PHOTO 10

HOUR 2 MAXIMUM EBB

HOUR 9 MAXIMUM FLOOD

VELOCITY SCALE

5 0 5 10 15

FPS PROTOTYPE

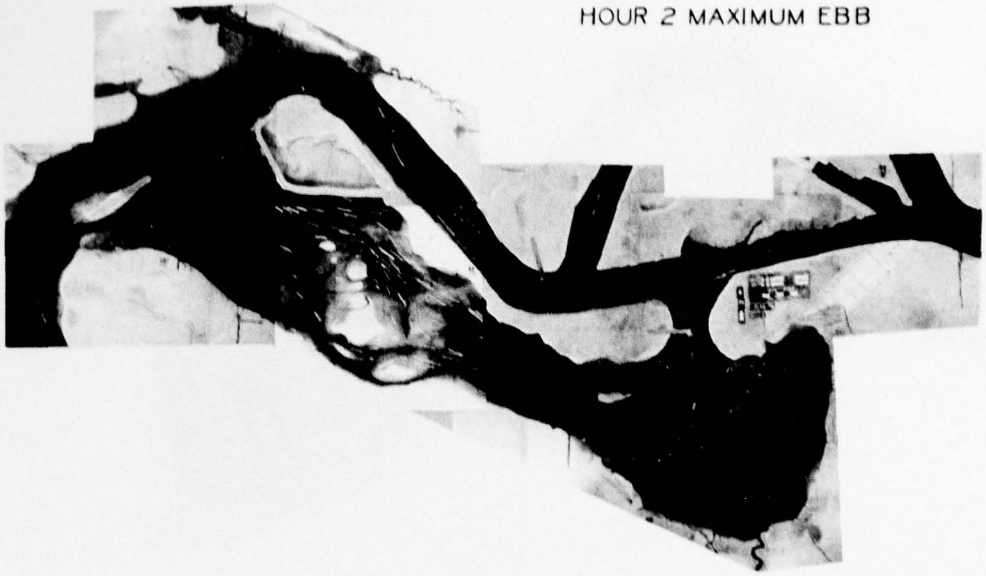
MILL COVE STUDY

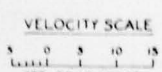
SURFACE CURRENT PATTERNS

PLAN 4

HOURS 2 AND 9

PHOTO 11





MILL COVE STUDY

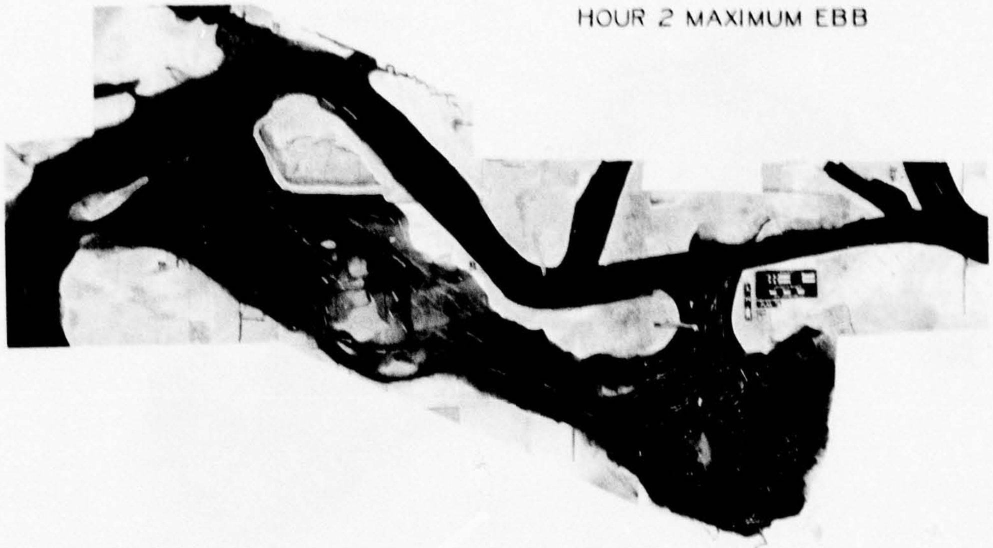
SURFACE CURRENT PATTERNS

PLAN 5

HOURS 2 AND 9

PHOTO 12

HOUR 2 MAXIMUM EBB



HOUR 9 MAXIMUM FLOOD

VELOCITY SCALE

5 0 5 10 15

FPS PROTOTYPE

MILL COVE STUDY

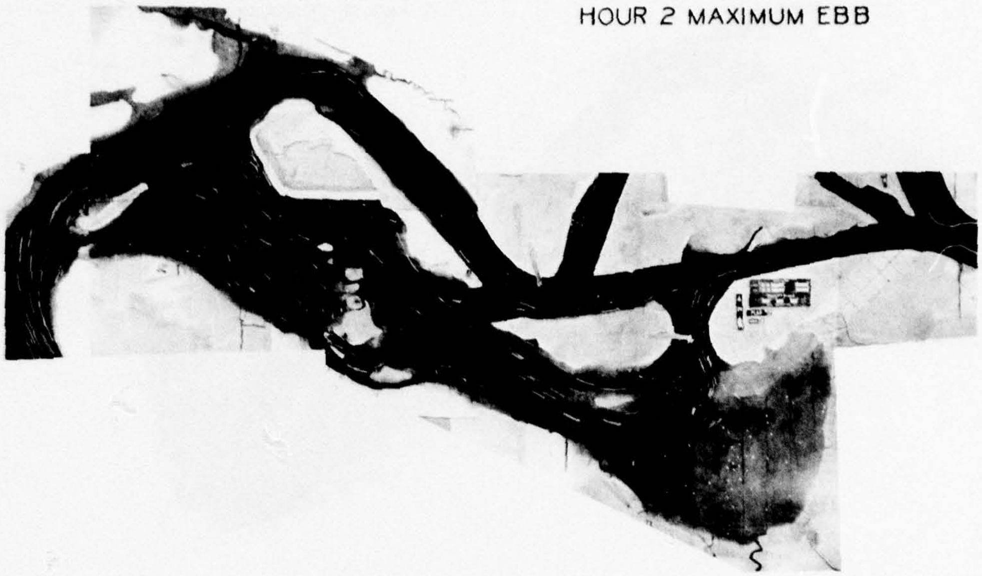
SURFACE CURRENT PATTERNS

PLAN 6

HOURS 2 AND 9

PHOTO 13

HOUR 2 MAXIMUM EBB



HOUR 9 MAXIMUM FLOOD

VELOCITY SCALE

5 0 5 10 15

FPS PROTOTYPE

MILL COVE STUDY

SURFACE CURRENT PATTERNS

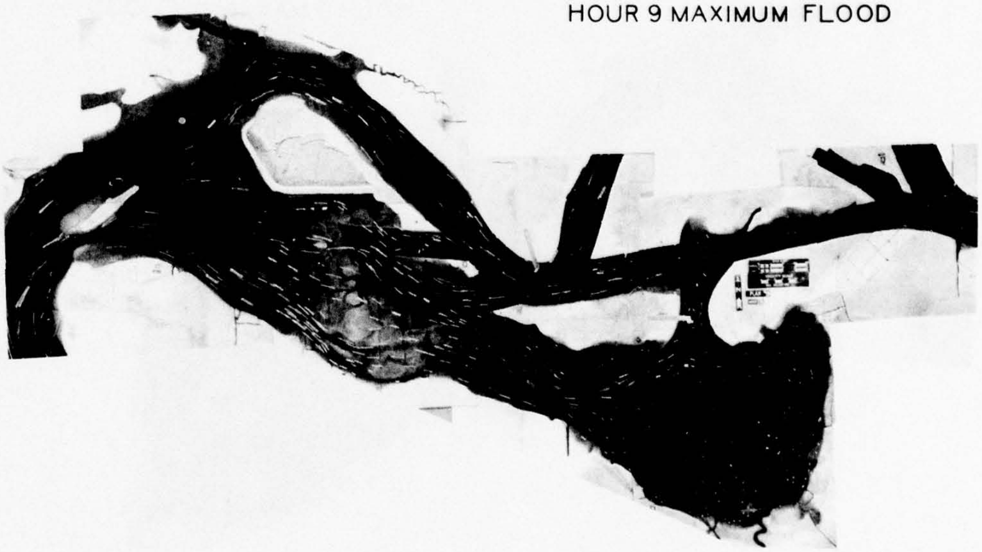
PLAN 7

HOURS 2 AND 9

PHOTO 14

HOUR 2 MAXIMUM EBB

HOUR 9 MAXIMUM FLOOD



VELOCITY SCALE

5 0 5 10 15

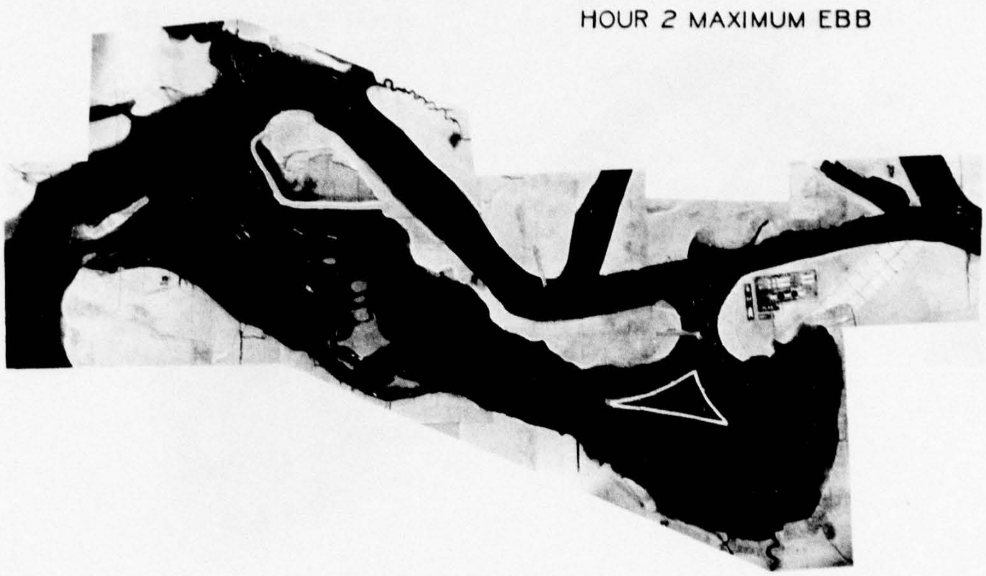
FPS PROTOTYPE

MILL COVE STUDY

SURFACE CURRENT PATTERNS

PLAN 8

HOURS 2 AND 9



VELOCITY SCALE
5 0 5 10 15
FPS PROTOTYPE

MILL COVE STUDY
SURFACE CURRENT PATTERNS
PLAN 9
HOURS 2 AND 9

PHOTO 16

HOUR 2 MAXIMUM EBB

HOUR 9 MAXIMUM FLOOD

VELOCITY SCALE
5 0 5 10 15
FPS PROTOTYPE

MILL COVE STUDY

SURFACE CURRENT PATTERNS

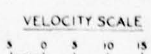
PLAN 10

HOURS 2 AND 9

PHOTO 17

HOUR 2 MAXIMUM EBB

HOUR 9 MAXIMUM FLOOD



MILL COVE STUDY

SURFACE CURRENT PATTERNS

PLAN 11

HOURS 2 AND 9

PHOTO 18

HOUR 2 MAXIMUM EBB

HOUR 9 MAXIMUM FLOOD

VELOCITY SCALE

5 0 5 10 15

FPS PROTOTYPE

MILL COVE STUDY

SURFACE CURRENT PATTERNS

PLAN 12

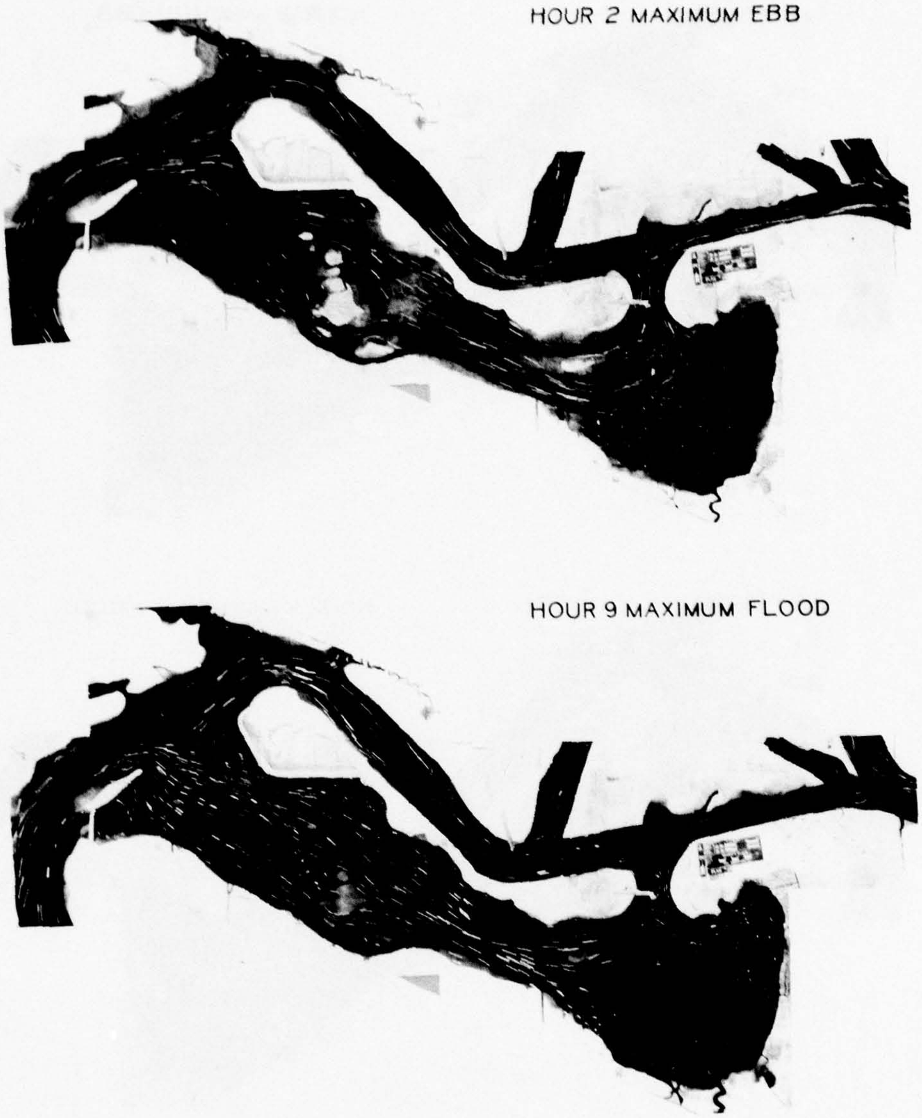
HOURS 2 AND 9

PHOTO 19

VELOCITY SCALE
5 0 5 10 15
FPS PROTOTYPE

MILL COVE STUDY
SURFACE CURRENT PATTERNS
PLAN 13
HOURS 2 AND 9

PHOTO 20



VELOCITY SCALE

5 0 5 10 15

FPS PROTOTYPE

MILL COVE STUDY

SURFACE CURRENT PATTERNS

PLAN 14

HOURS 2 AND 9

PHOTO 21

VELOCITY SCALE
5 0 5 10 15
FPS PROTOTYPE

MILL COVE STUDY
SURFACE CURRENT PATTERNS
PLAN 16
HOURS 2 AND 9

PHOTO 22

HOUR 2 MAXIMUM EBB

HOUR 9 MAXIMUM FLOOD

VELOCITY SCALE
5 0 5 10 15
FPS PROTOTYPE

MILL COVE STUDY

SURFACE CURRENT PATTERNS

PLAN 17

HOURS 2 AND 9

PHOTO 23

HOUR 2 MAXIMUM EBB

HOUR 9 MAXIMUM FLOOD

VELOCITY SCALE
5 0 5 10 15
FPS PROTOTYPE

MILL COVE STUDY

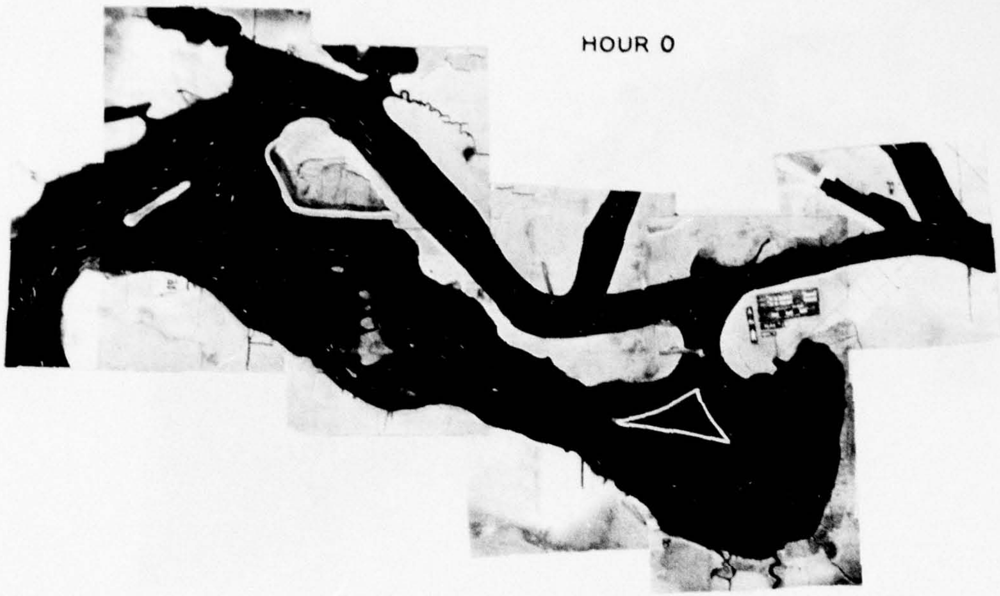
SURFACE CURRENT PATTERNS

PLAN 19

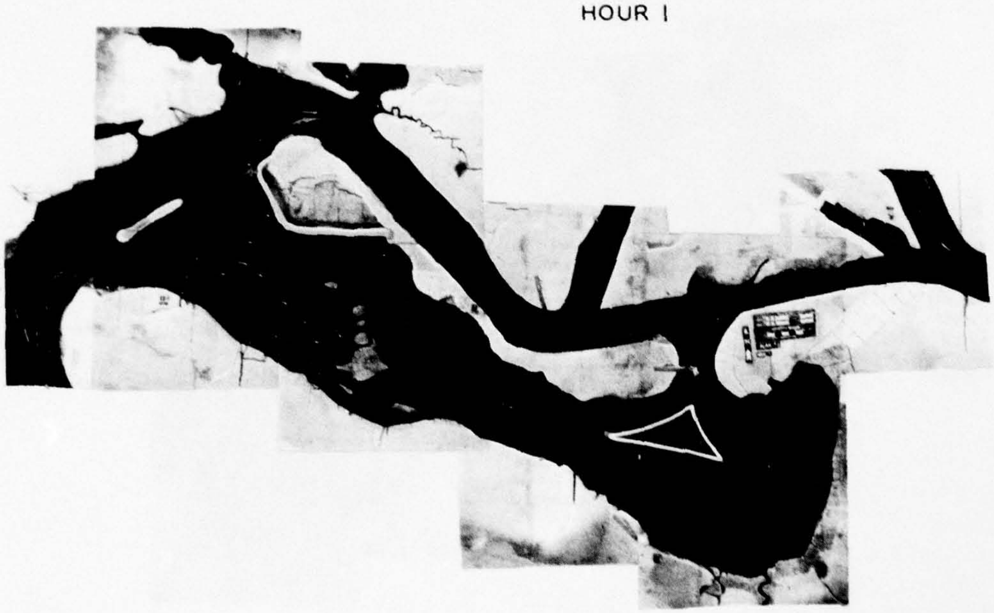
HOURS 2 AND 9

PHOTO 24

HOUR 0



HOUR 1

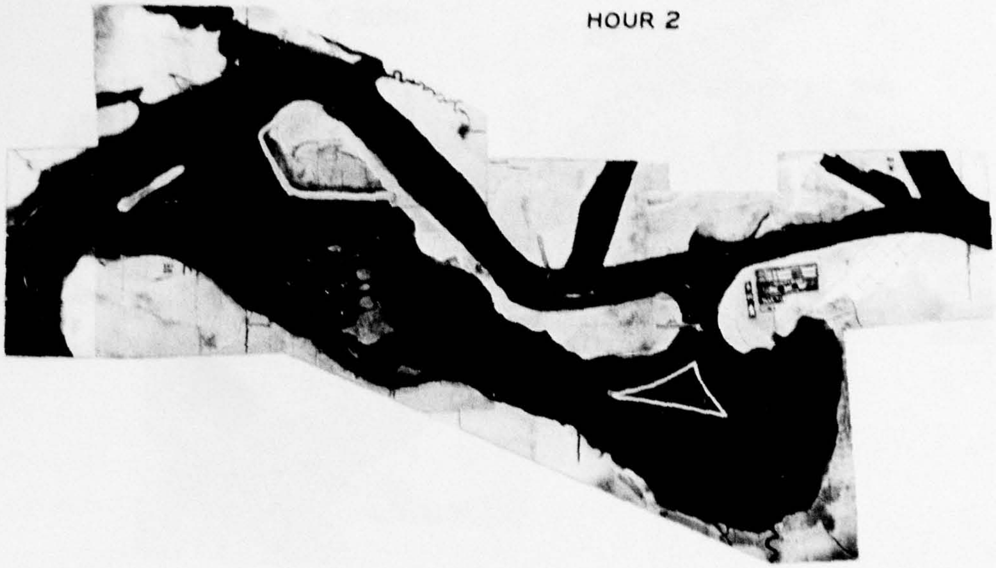


VELOCITY SCALE
5 0 5 10 15
FPS PROTOTYPE

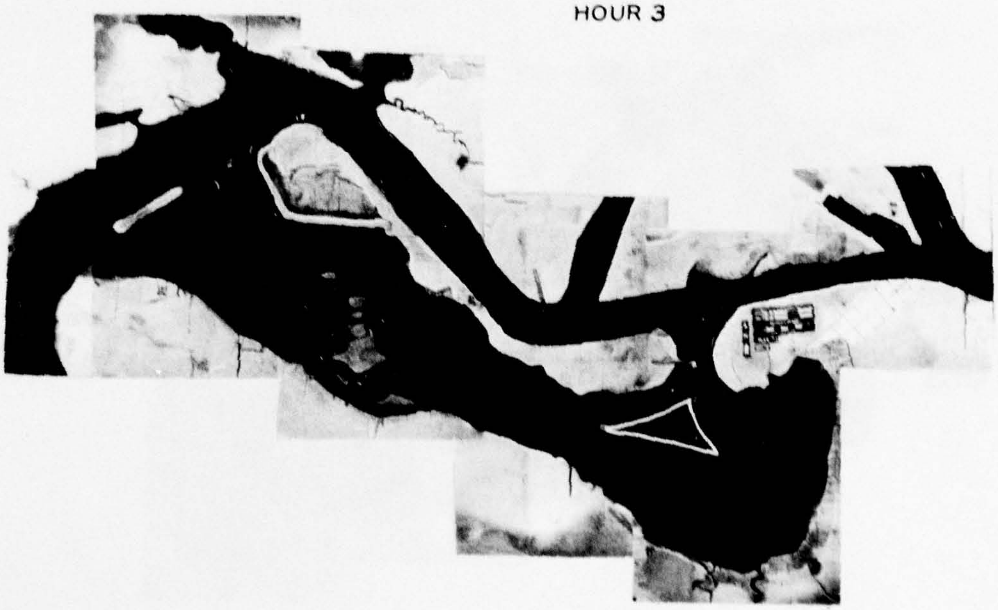
MILL COVE STUDY
SURFACE CURRENT PATTERNS
PLAN 15
HOURS 0 AND 1

PHOTO 25

HOUR 2



HOUR 3



VELOCITY SCALE

5 0 5 10 15

FPS PROTOTYPE

MILL COVE STUDY

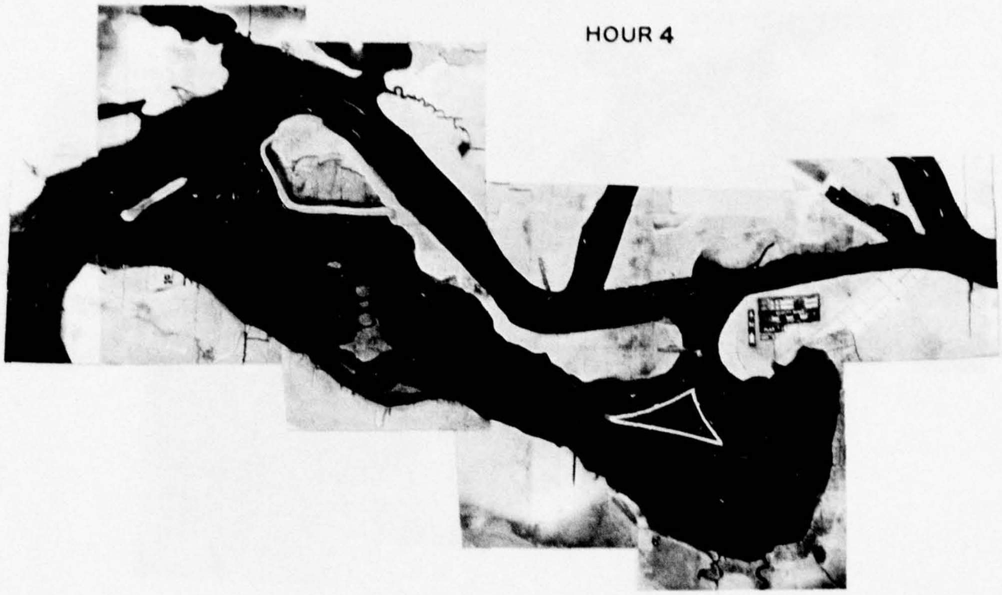
SURFACE CURRENT PATTERNS

PLAN 15

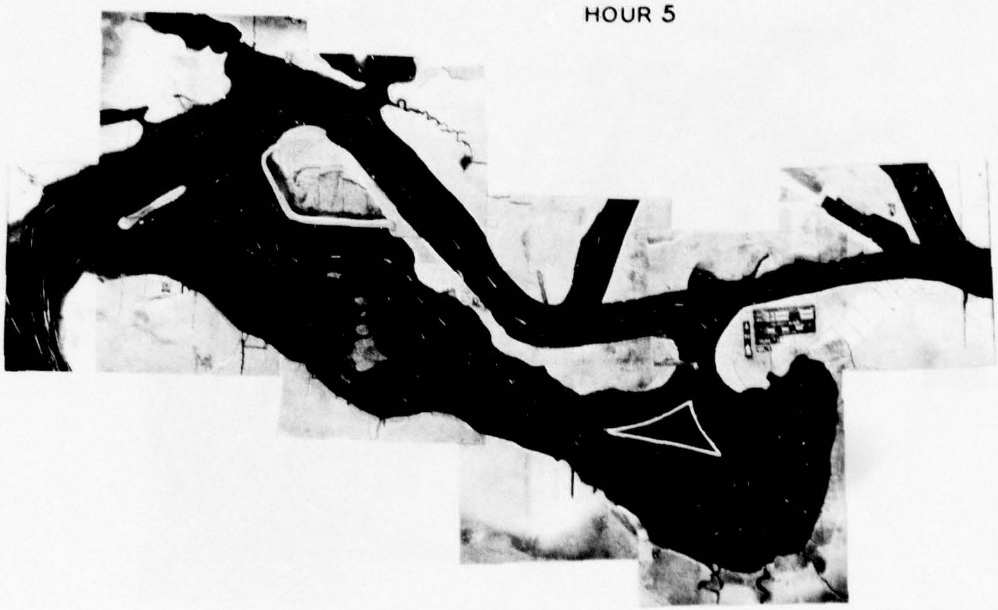
HOURS 2 AND 3

PHOTO 26

HOUR 4



HOUR 5



VELOCITY SCALE

5 0 5 10 15

FPS PROTOTYPE

MILL COVE STUDY

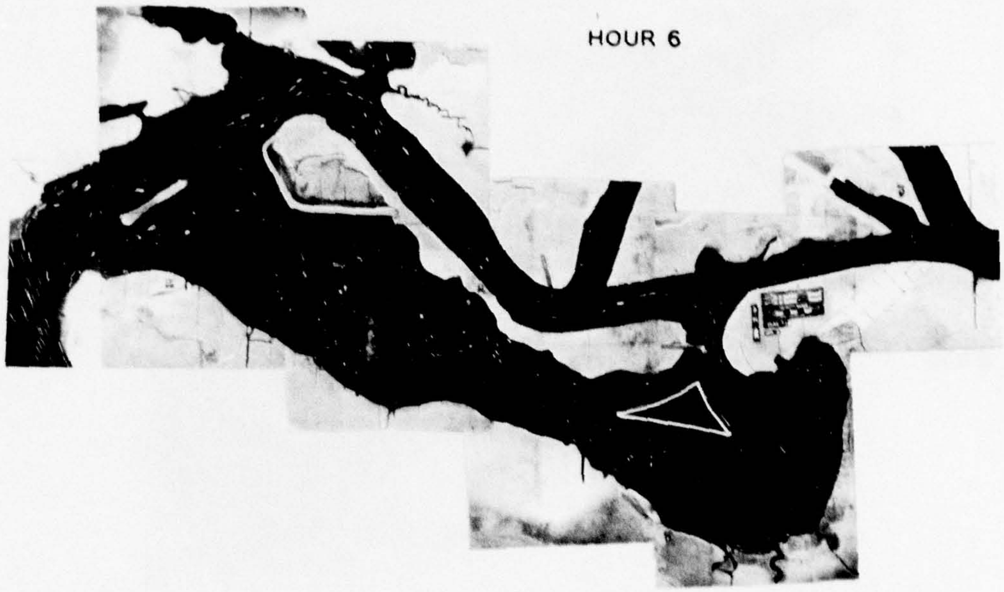
SURFACE CURRENT PATTERNS

PLAN 15

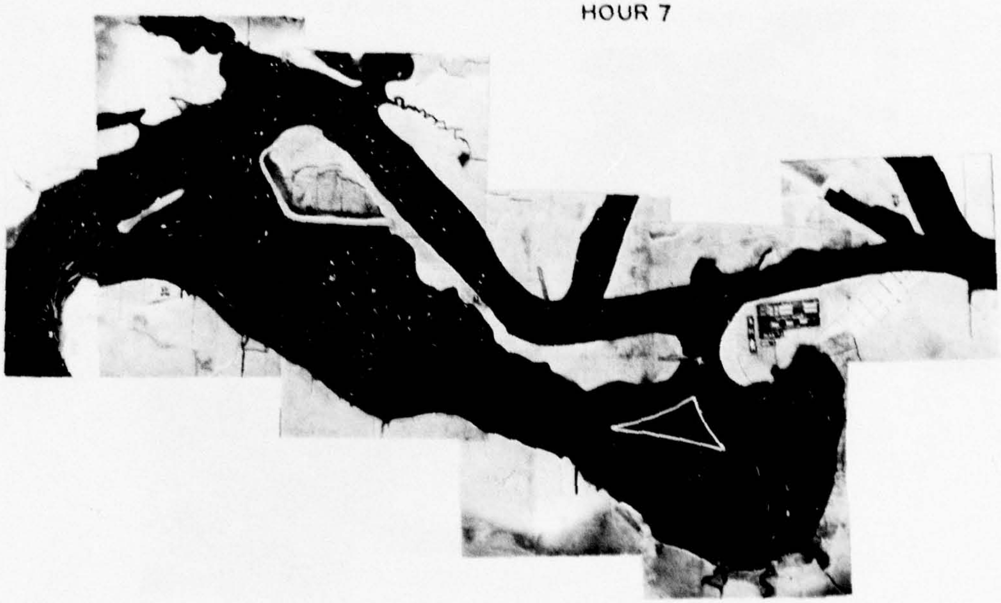
HOURS 4 AND 5

PHOTO 27

HOUR 6



HOUR 7

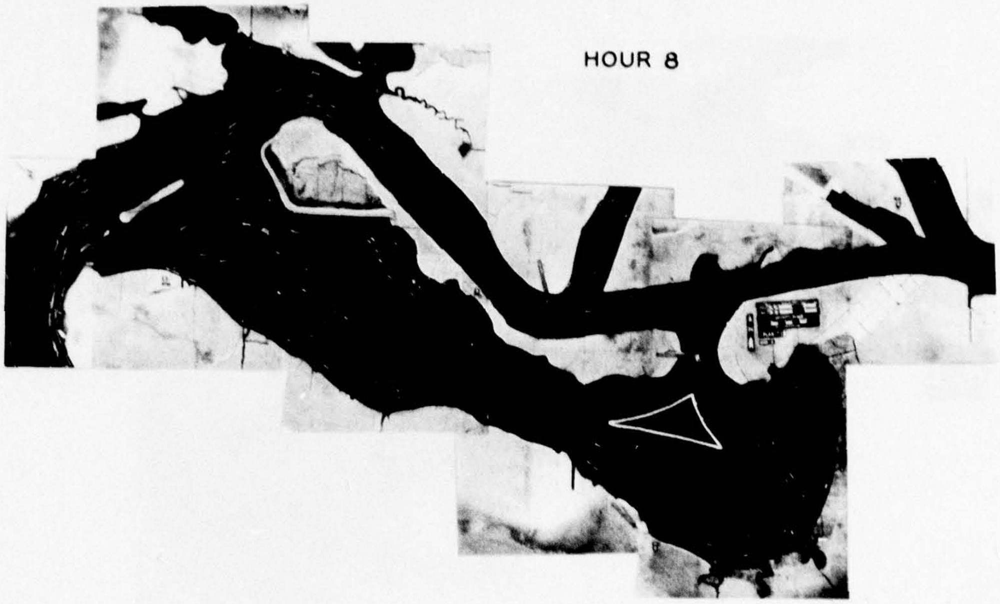


VELOCITY SCALE
5 0 5 10 15
FPS PROTOTYPE

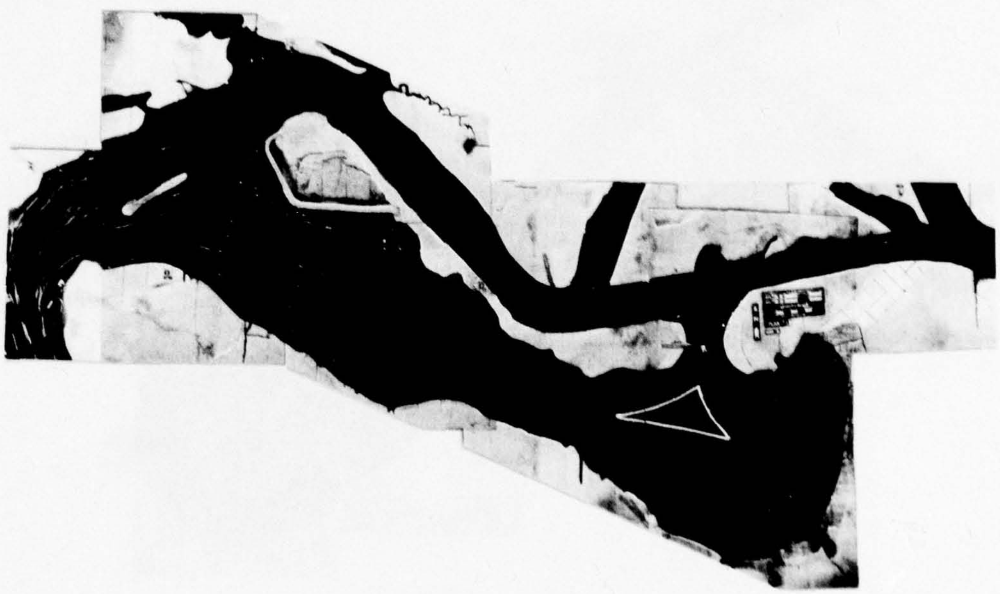
MILL COVE STUDY
SURFACE CURRENT PATTERNS
PLAN 15
HOURS 6 AND 7

PHOTO 28

HOUR 8



HOUR 9



MILL COVE STUDY

SURFACE CURRENT PATTERNS

PLAN 15

HOURS 8 AND 9

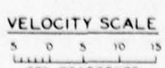
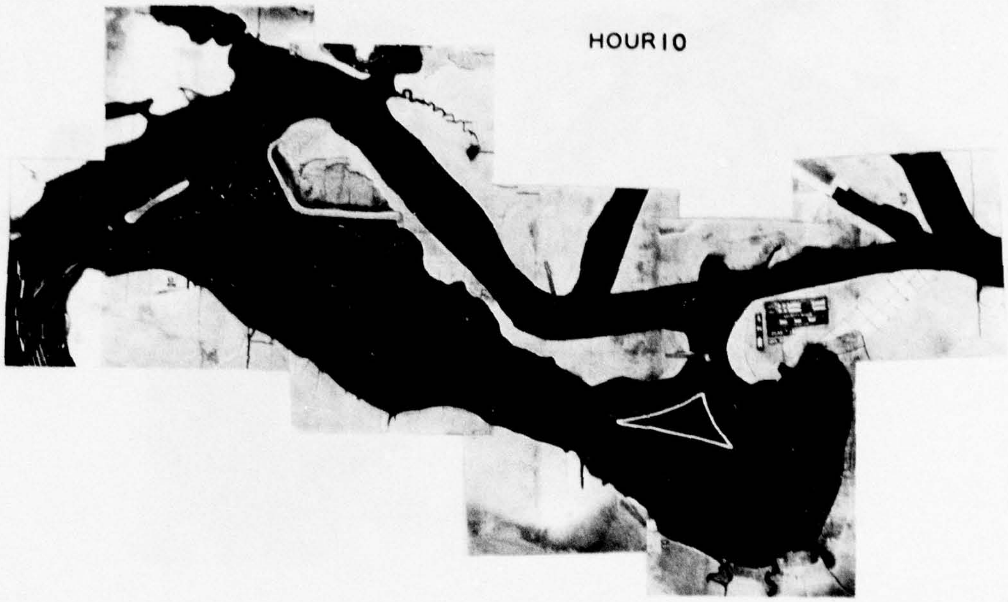
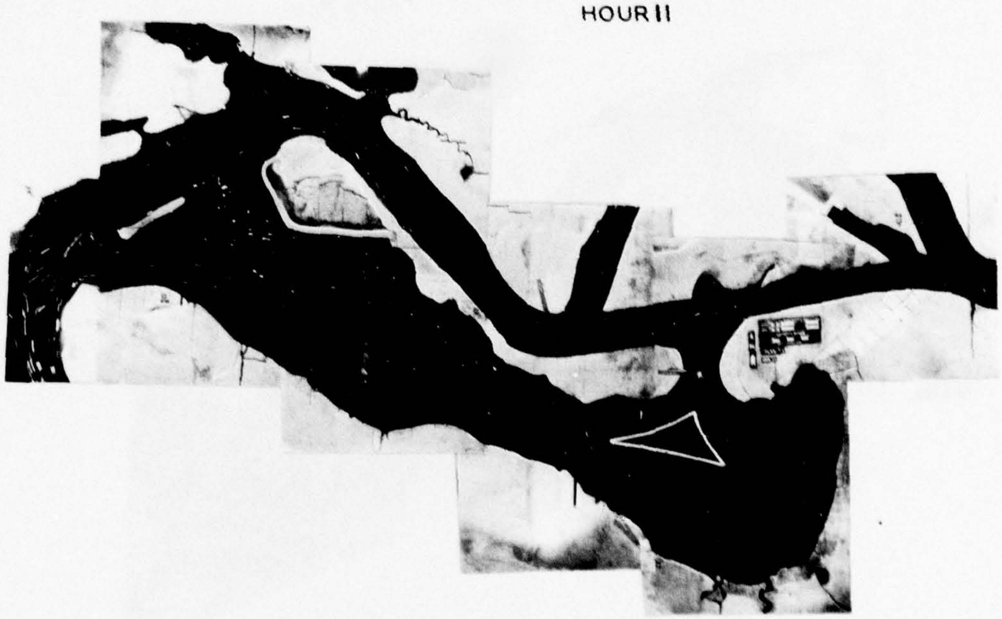


PHOTO 29

HOUR 10



HOUR 11



VELOCITY SCALE
5 0 5 10 15
FPS PROTOTYPE

MILL COVE STUDY
SURFACE CURRENT PATTERNS
PLAN 15
HOURS 10 AND 11

PHOTO 30

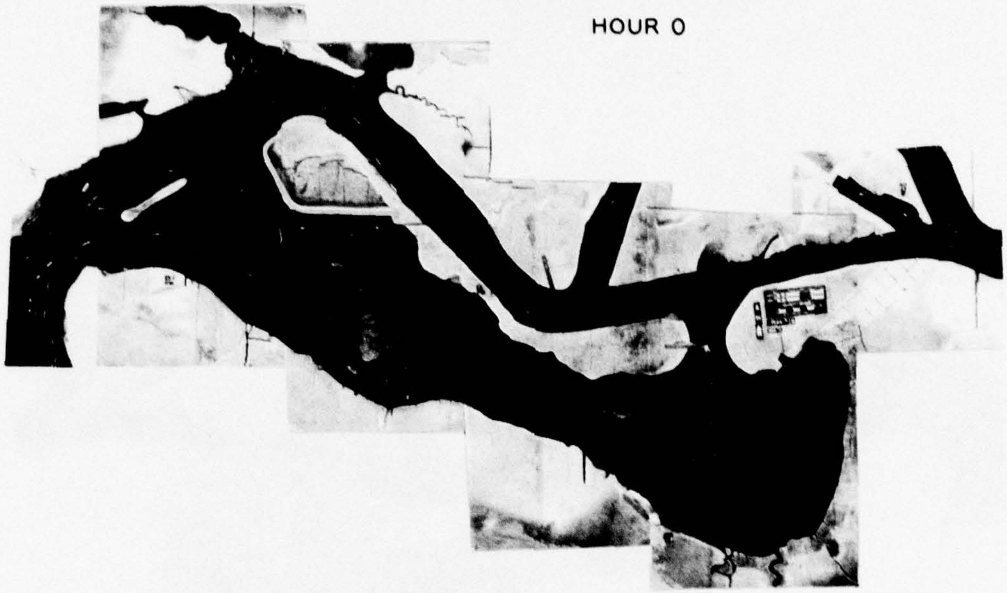
HOUR 12

VELOCITY SCALE
5 0 5 10 15
FPS PROTOTYPE

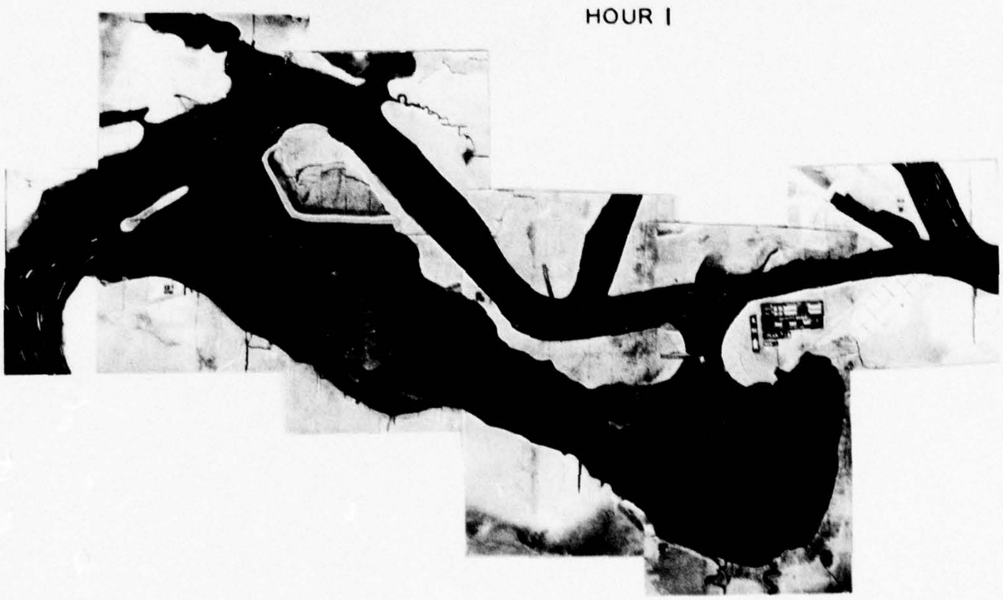
MILL COVE STUDY
SURFACE CURRENT PATTERNS
PLAN 15
HOUR 12

PHOTO 31

HOUR 0



HOUR 1



VELOCITY SCALE

5 0 5 10 15

FPS PROTOTYPE

MILL COVE STUDY

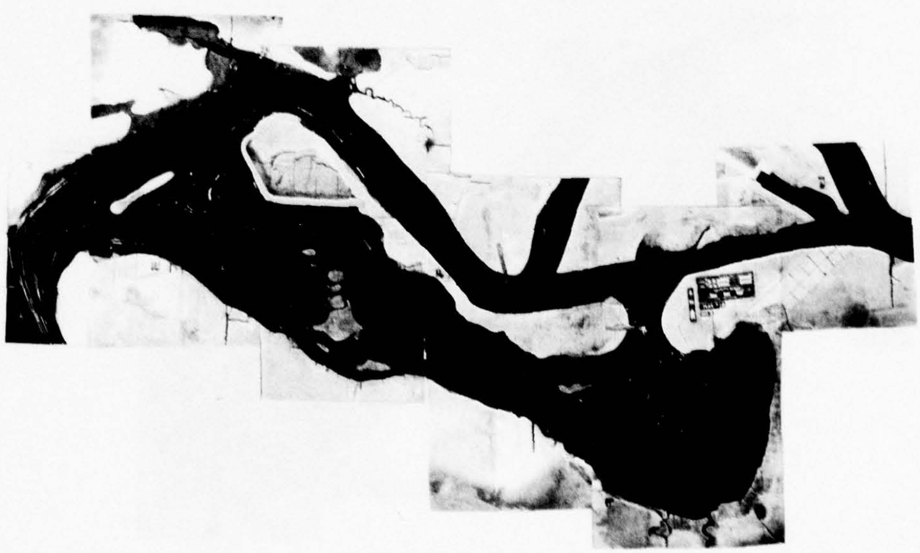
SURFACE CURRENT PATTERNS

PLAN 18

HOURS 0 AND 1

HOUR 2

HOUR 3

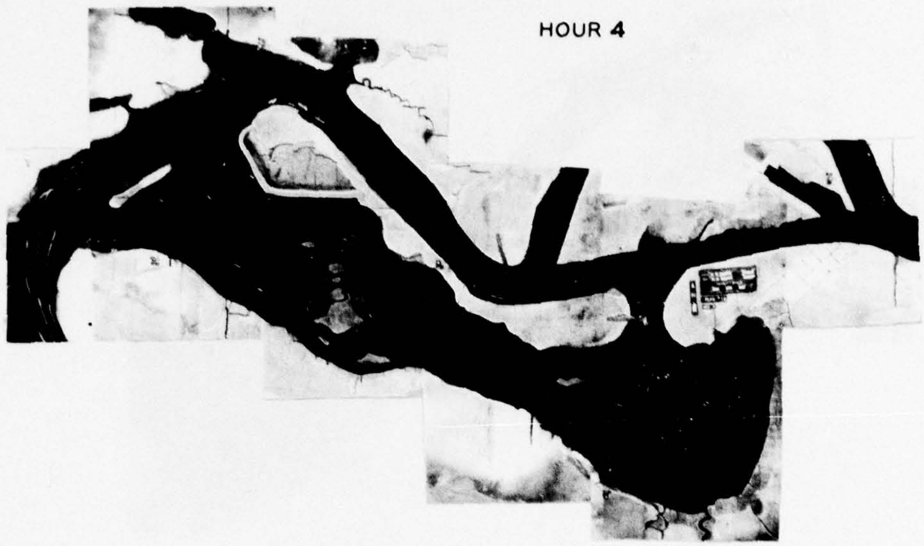


VELOCITY SCALE
5 0 5 10 15
FPS PROTOTYPE

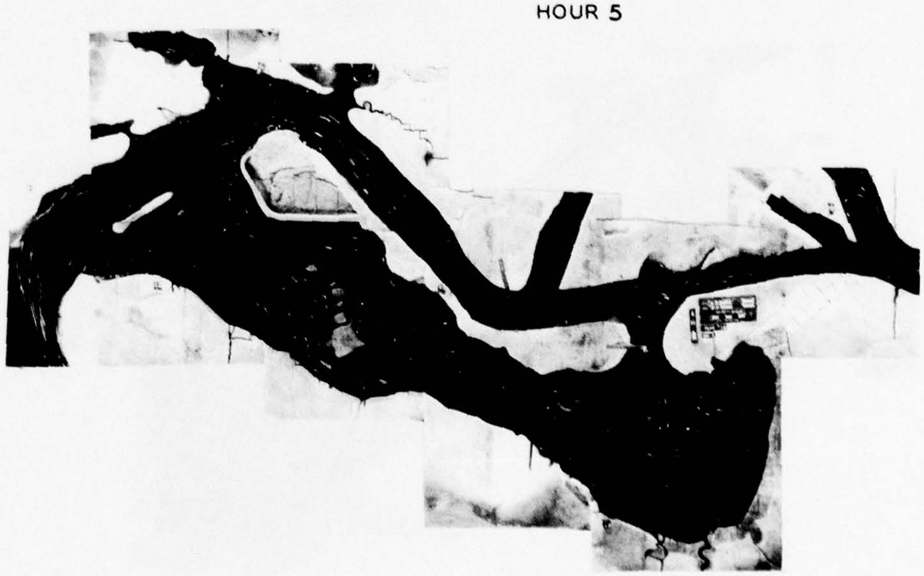
MILL COVE STUDY
SURFACE CURRENT PATTERNS
PLAN 18
HOURS 2 AND 3

PHOTO 20

HOUR 4



HOUR 5



VELOCITY SCALE
5 0 5 10 15
FPS PROTOTYPE

MILL COVE STUDY

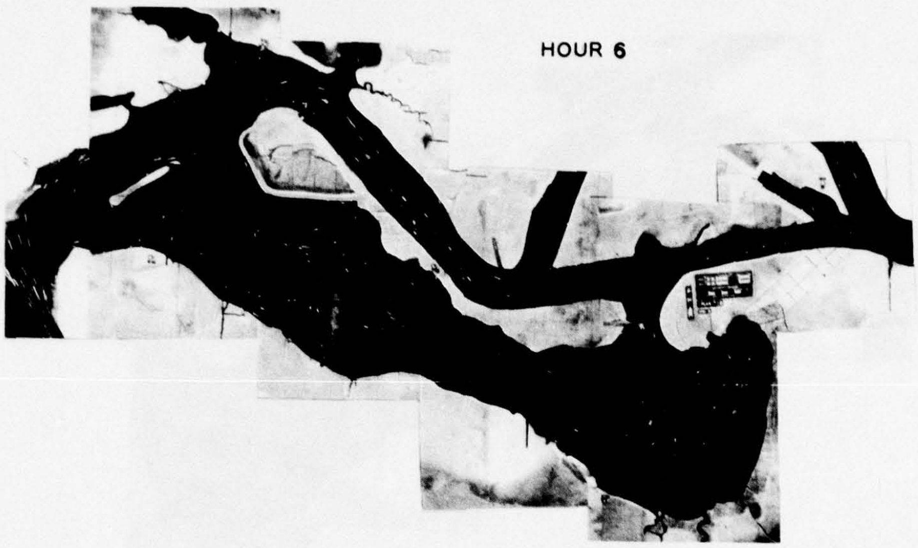
SURFACE CURRENT PATTERNS

PLAN 18

HOURS 4 AND 5

PHOTO 34

HOUR 6



HOUR 7

VELOCITY SCALE

5 0 5 10 15

FPS PROTOTYPE

MILL COVE STUDY

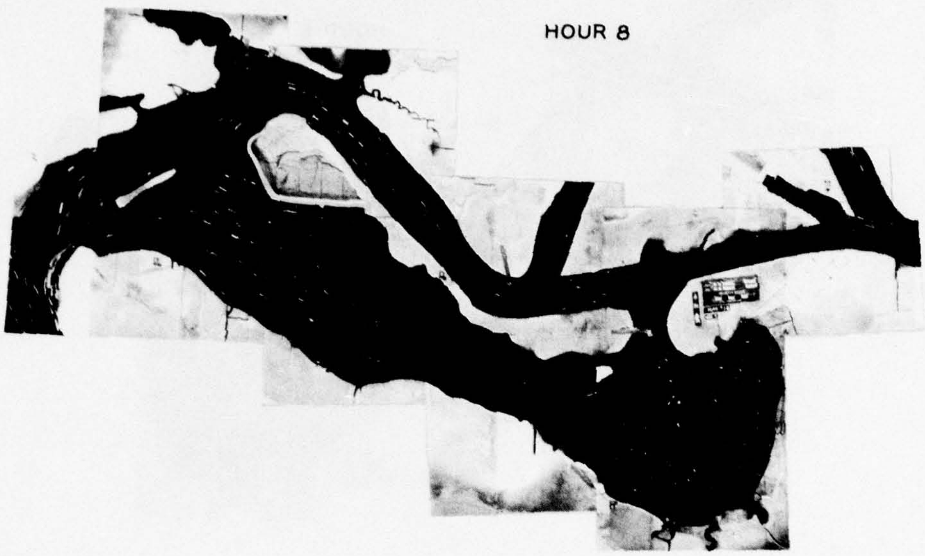
SURFACE CURRENT PATTERNS

PLAN 18

HOURS 6 AND 7

PHOTO 22

HOUR 8



HOUR 9

VELOCITY SCALE

5 0 5 10 15

FPS PROTOTYPE

MILL COVE STUDY

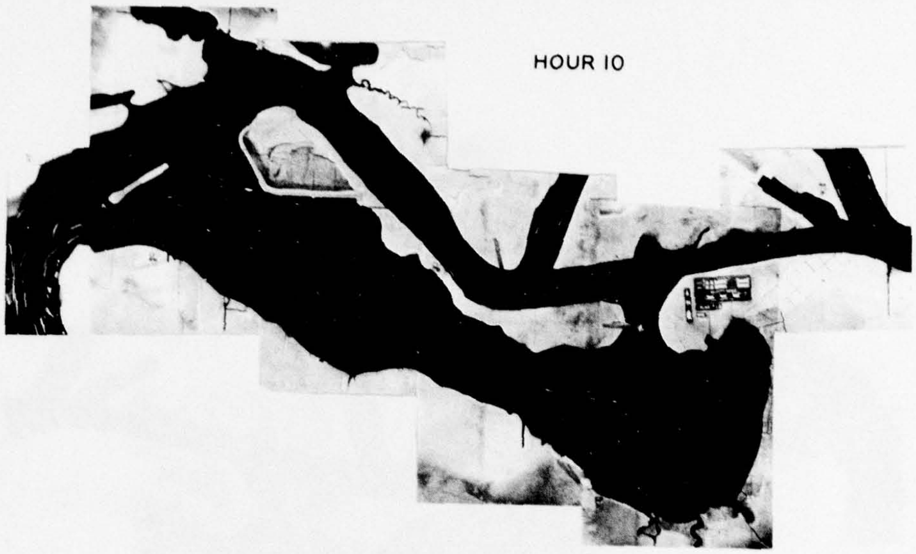
SURFACE CURRENT PATTERNS

PLAN 18

HOURS 8 AND 9

PHOTO 36

HOUR 10



HOUR 11

VELOCITY SCALE

5 0 5 10 15

FPS PROTOTYPE

MILL COVE STUDY

SURFACE CURRENT PATTERNS

PLAN 18

HOURS 10 AND 11

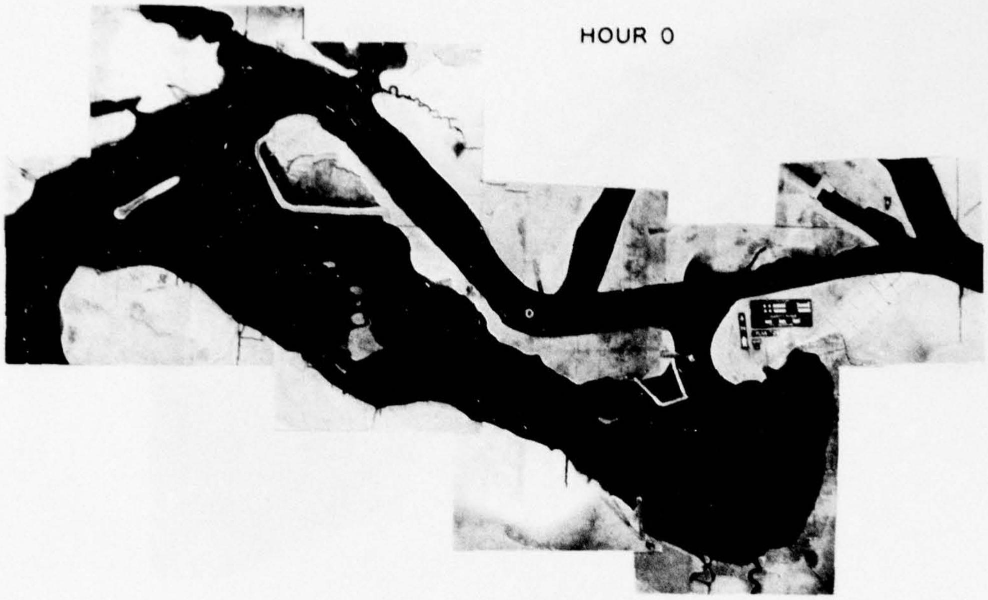
HOUR 12

VELOCITY SCALE
5 0 5 10 15
FPS PROTOTYPE

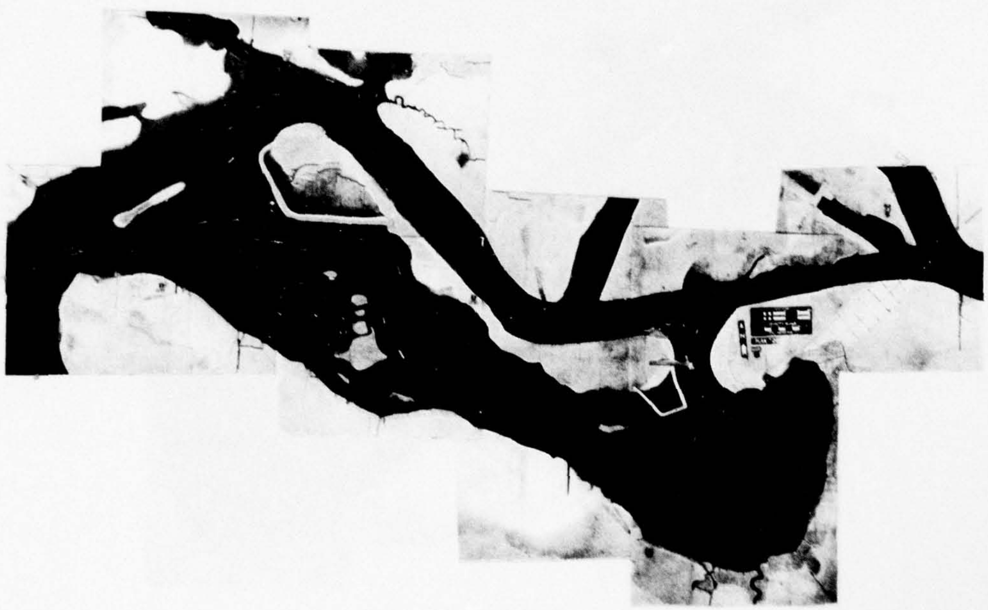
MILL COVE STUDY
SURFACE CURRENT PATTERNS
PLAN 18
HOUR 12

PHOTO 38

HOUR 0



HOUR 1



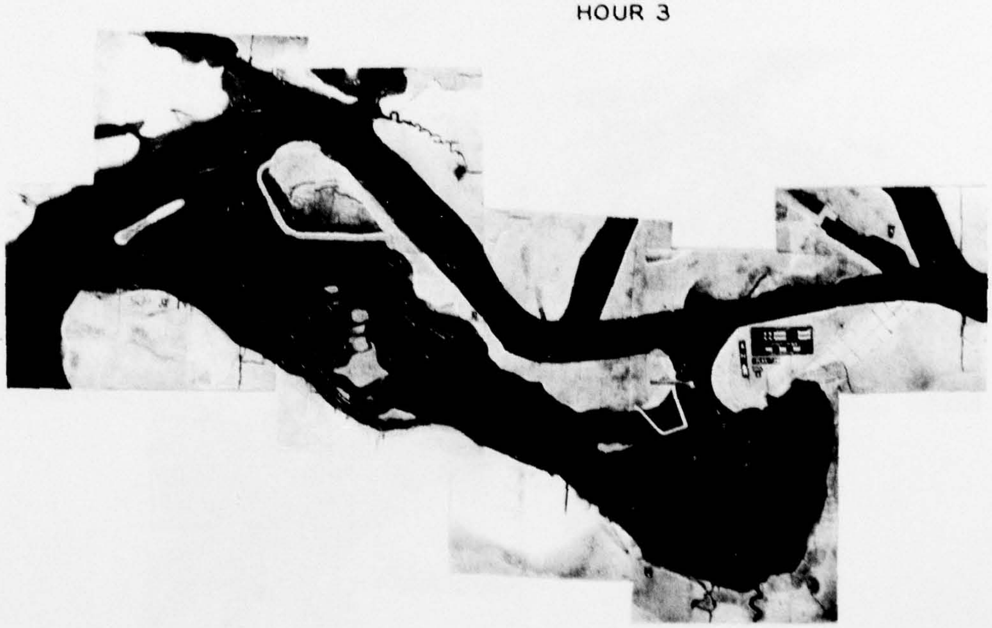
VELOCITY SCALE
5 0 5 10 15
FPS PROTOTYPE

MILL COVE STUDY
SURFACE CURRENT PATTERNS
PLAN 20
HOURS 0 AND 1

PHOTO 39

HOUR 2

HOUR 3



VELOCITY SCALE
5 0 5 10 15
FPS PROTOTYPE

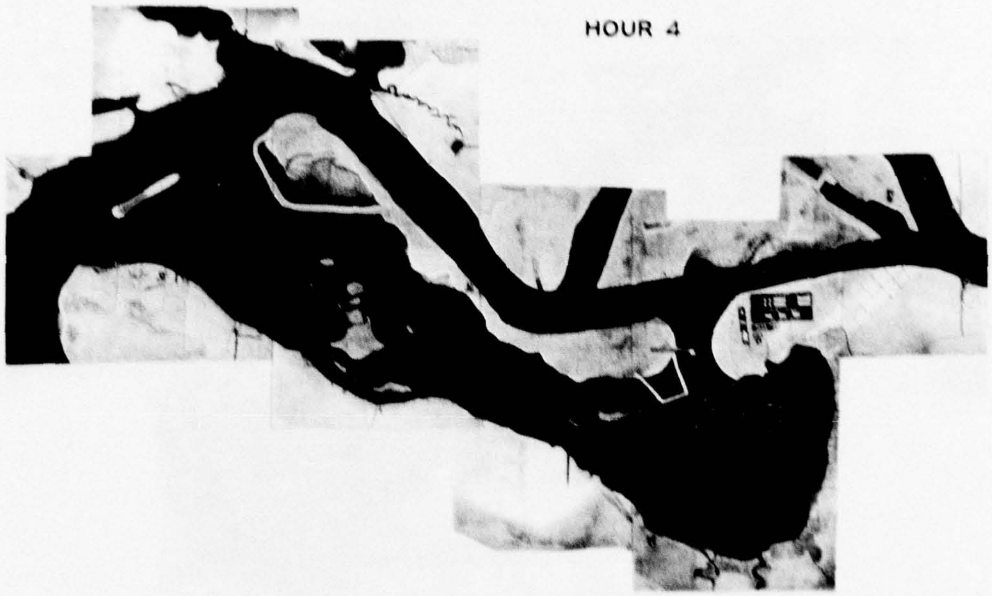
MILL COVE STUDY

SURFACE CURRENT PATTERNS

PLAN 20
HOURS 2 AND 3

PHOTO 40

HOUR 4



HOUR 5

VELOCITY SCALE

5 0 5 10 15

FPS PROTOTYPE

MILL COVE STUDY

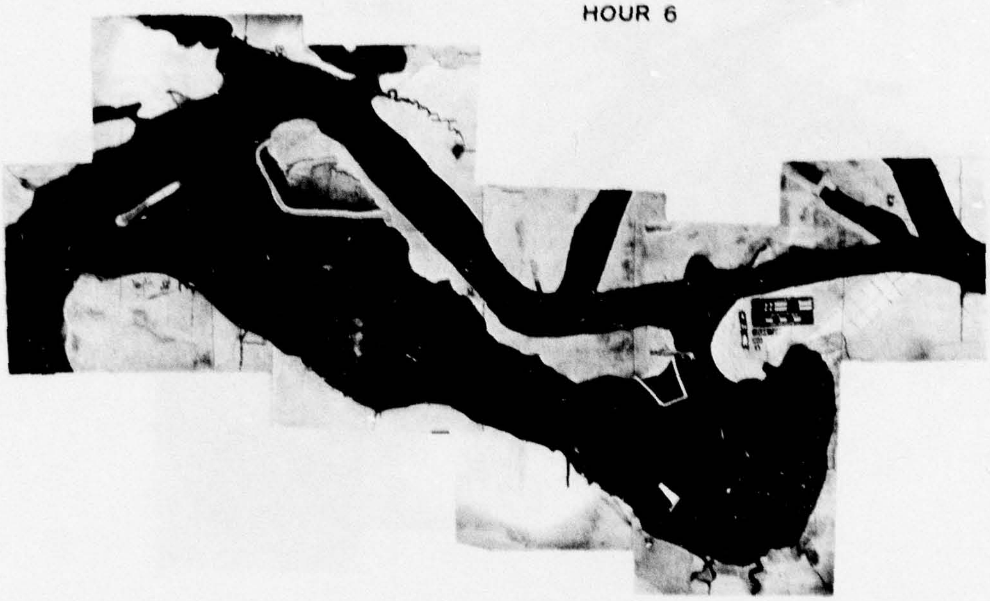
SURFACE CURRENT PATTERNS

PLAN 20

HOURS 4 AND 5

PHOTO 41

HOUR 6



HOUR 7

VELOCITY SCALE

5 0 5 10 15

FPS PROTOTYPE

MILL COVE STUDY

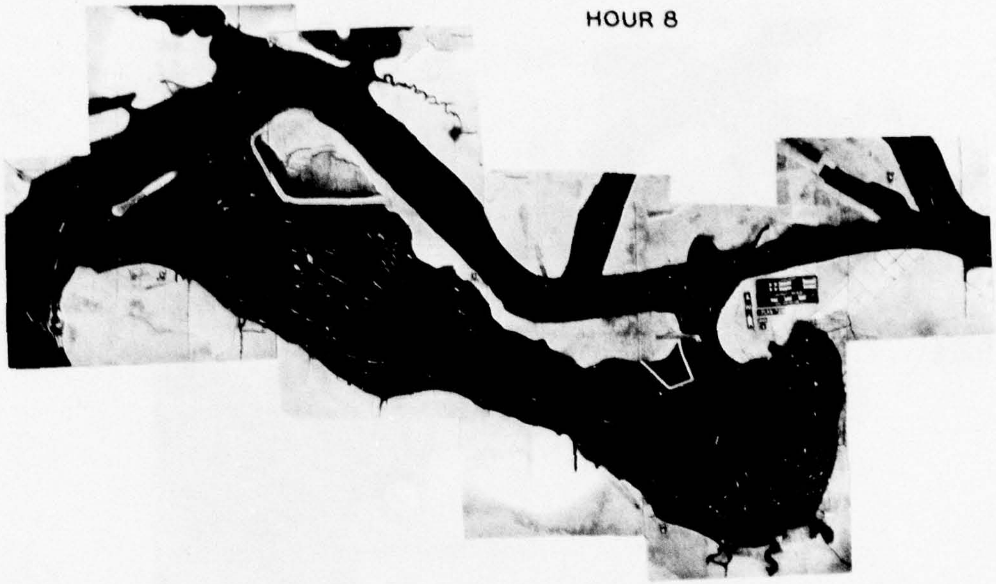
SURFACE CURRENT PATTERNS

PLAN 20

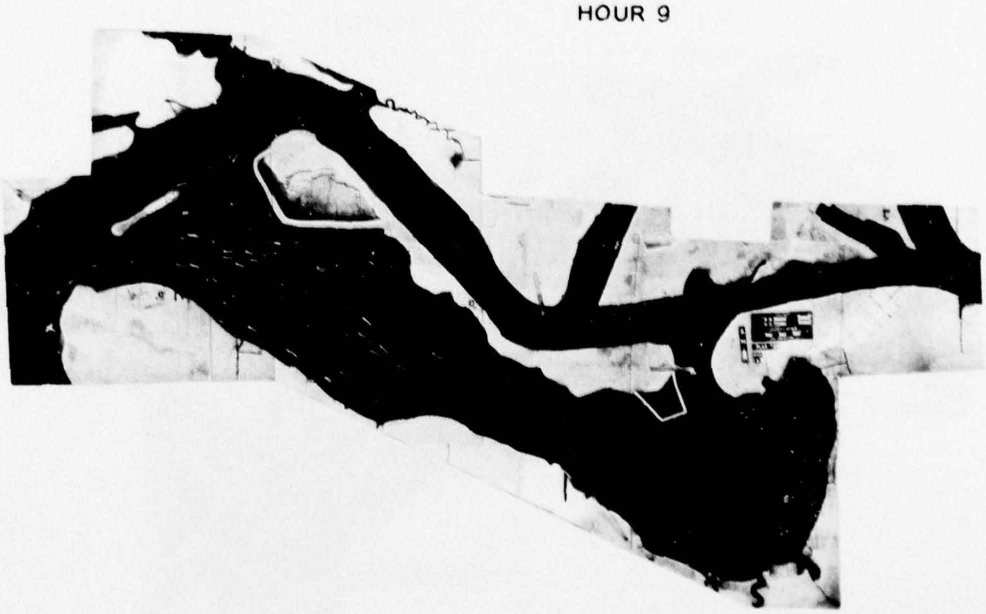
HOURS 6 AND 7

PHOTO 42

HOUR 8



HOUR 9



VELOCITY SCALE
5 0 5 10 15
FPS PROTOTYPE

MILL COVE STUDY

SURFACE CURRENT PATTERNS

PLAN 20
HOURS 8 AND 9

HOUR 10

HOUR 11

VELOCITY SCALE

5 0 5 10 15

FPS PROTOTYPE

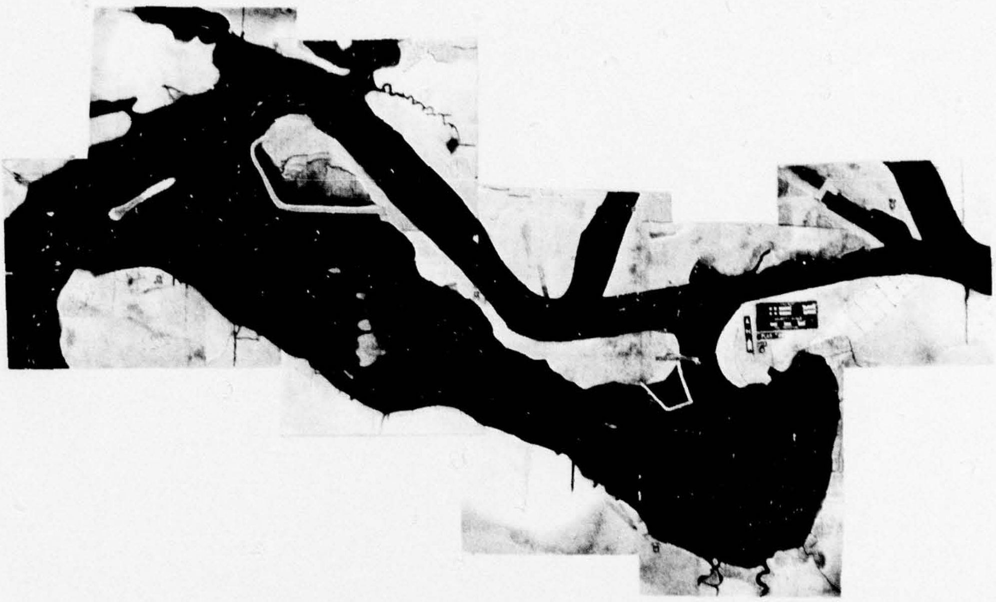
MILL COVE STUDY

SURFACE CURRENT PATTERNS

PLAN 20

HOURS 10 AND 11

PHOTO 44



HOUR 12

VELOCITY SCALE

5 0 5 10 15

FPS PROTOTYPE

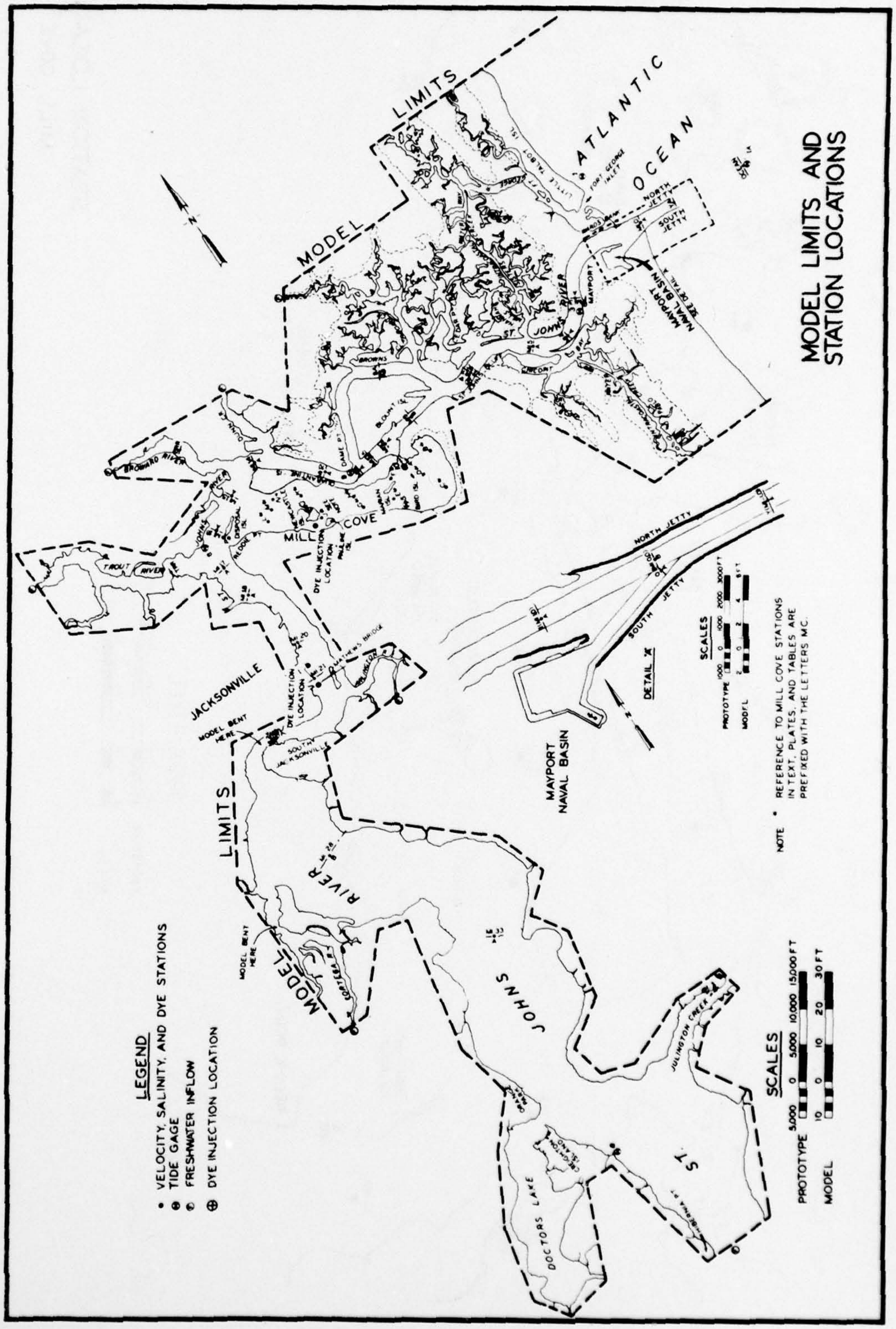
MILL COVE STUDY

SURFACE CURRENT PATTERNS

PLAN 20

HOUR 12

PHOTO 45



MODEL LIMITS AND STATION LOCATIONS

PLATE 1

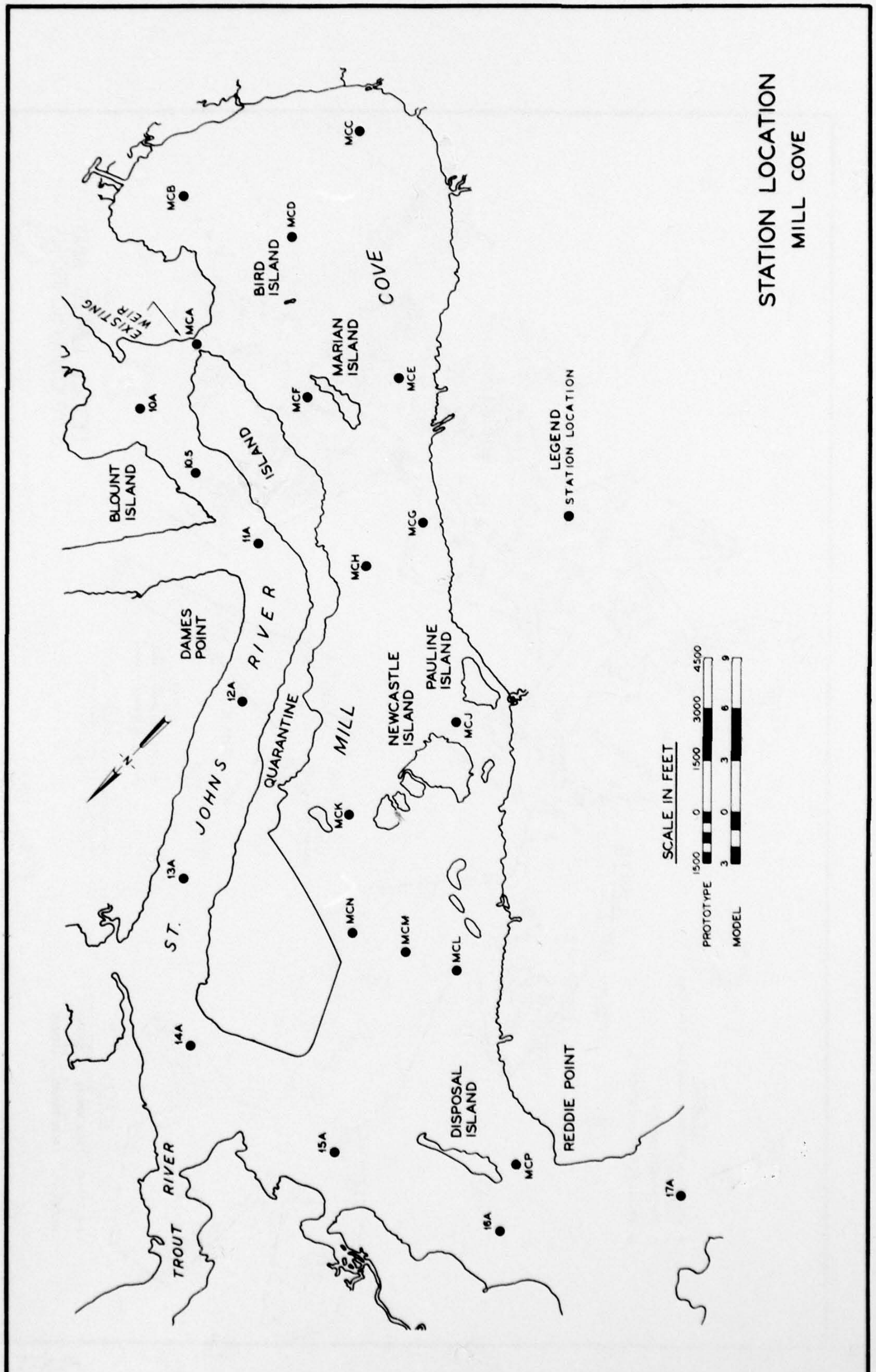
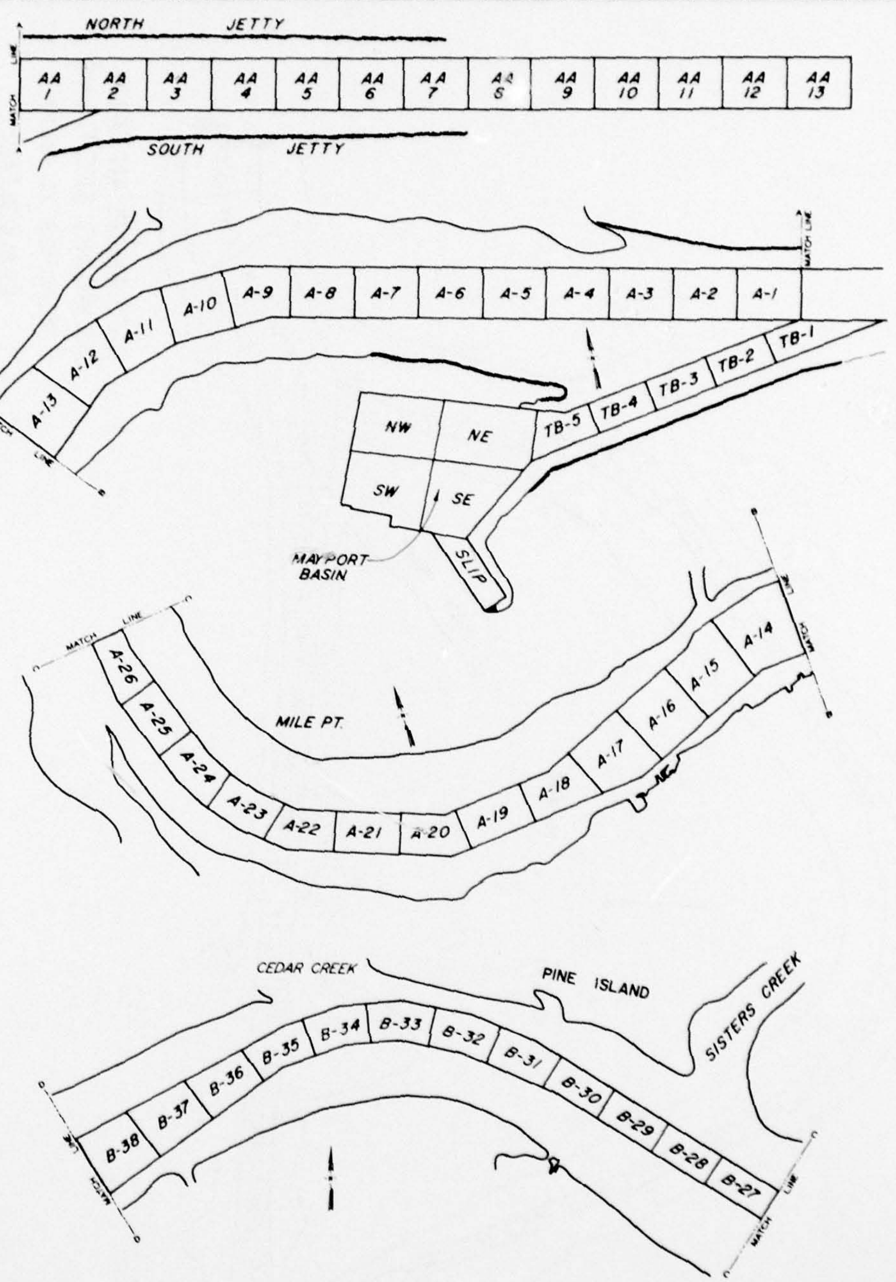

STATION LOCATION
MILL COVE
LEGEND
STATION LOCATION
SCALE IN FEET
PROTOTYPE
MODEL
1500
0
1500
3000
4500
3
0
3
6
9
EXISTING WEIR
MCA
MCB
MCC
MCD
MCE
MCF
MCG
MCH
MCJ
MCK
MCL
MCM
MCN
MCP
10A
10.5
11A
12A
13A
14A
15A
16A
17A
BLOUNT ISLAND
DAMES POINT
ST. JOHNS RIVER
QUARANTINE ISLAND
BIRD ISLAND
MARIAN ISLAND
MILL COVE
NEWCASTLE ISLAND
PAULINE ISLAND
DISPOSAL ISLAND
REDDIE POINT
TROUT RIVER
N

PLATE 2



BASE AND PLAN TESTS
SHOALING SECTIONS
REACHES AA, A, TB, AND B

SCALE IN FEET
500 0 500 1000 1500 2000

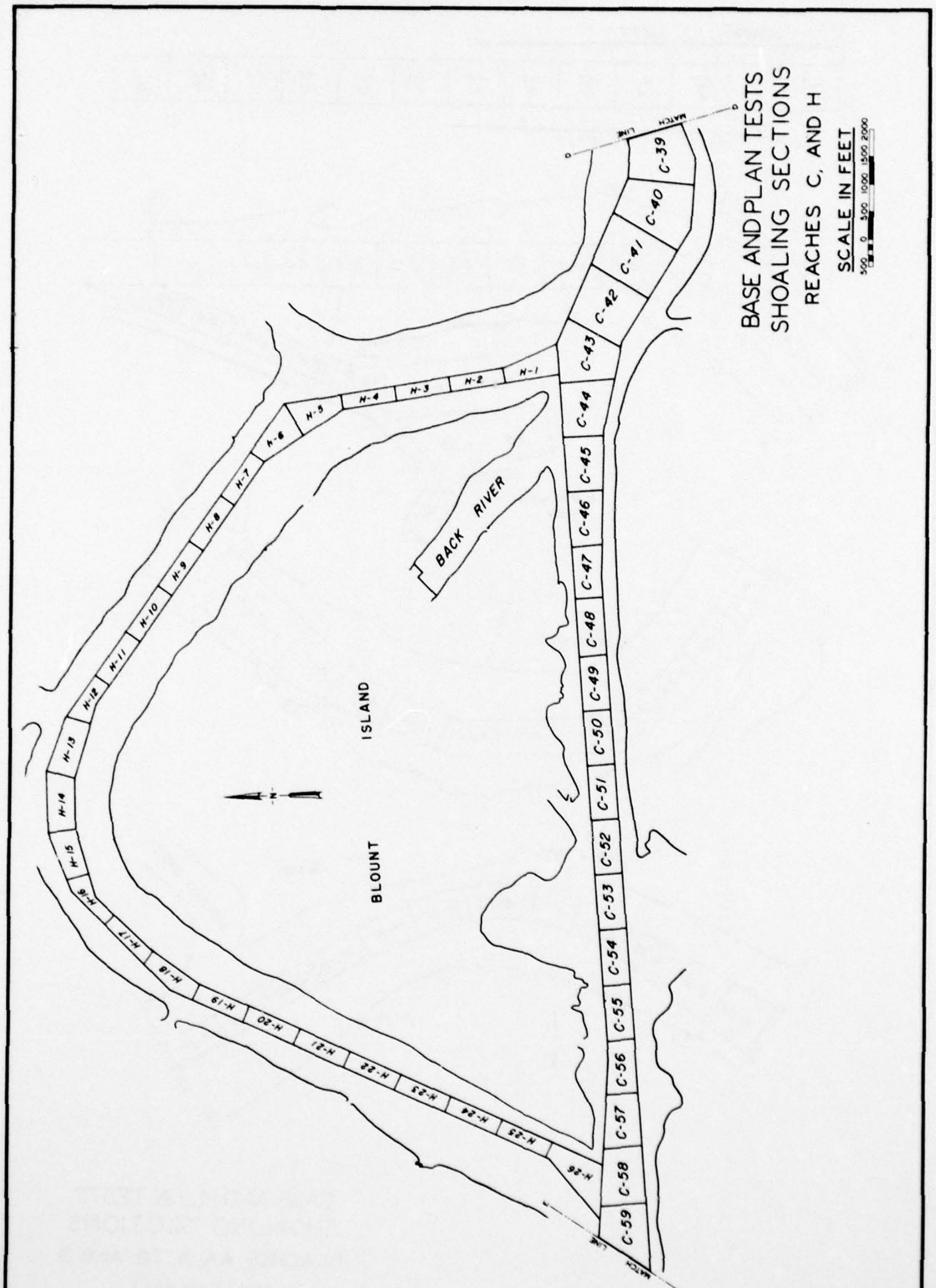
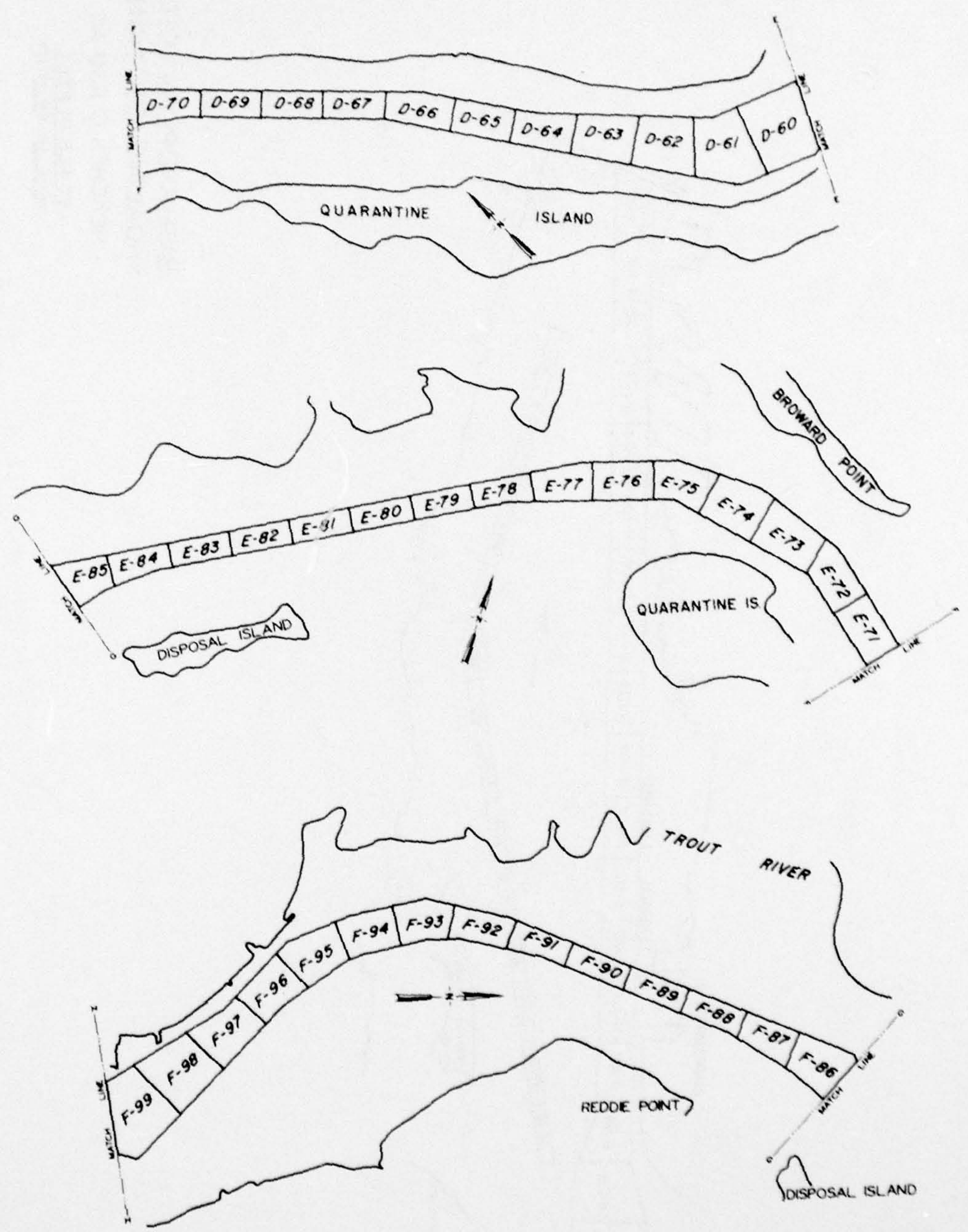

BASE AND PLAN TESTS
SHOALING SECTIONS
REACHES C, AND H
SCALE IN FEET
500 0 500 1000 1500 2000
MATCH LINE
BACK RIVER
BLOUNT
ISLAND
C-39
C-40
C-41
C-42
C-43
C-44
C-45
C-46
C-47
C-48
C-49
C-50
C-51
C-52
C-53
C-54
C-55
C-56
C-57
C-58
C-59
H-1
H-2
H-3
H-4
H-5
H-6
H-7
H-8
H-9
H-10
H-11
H-12
H-13
H-14
H-15
H-16
H-17
H-18
H-19
H-20
H-21
H-22
H-23
H-24
H-25
H-26

PLATE 4



BASE AND PLAN TESTS
SHOALING SECTIONS
REACHES D, E, AND F

SCALE IN FEET
500 0 500 1000 1500 2000

PLATE 5

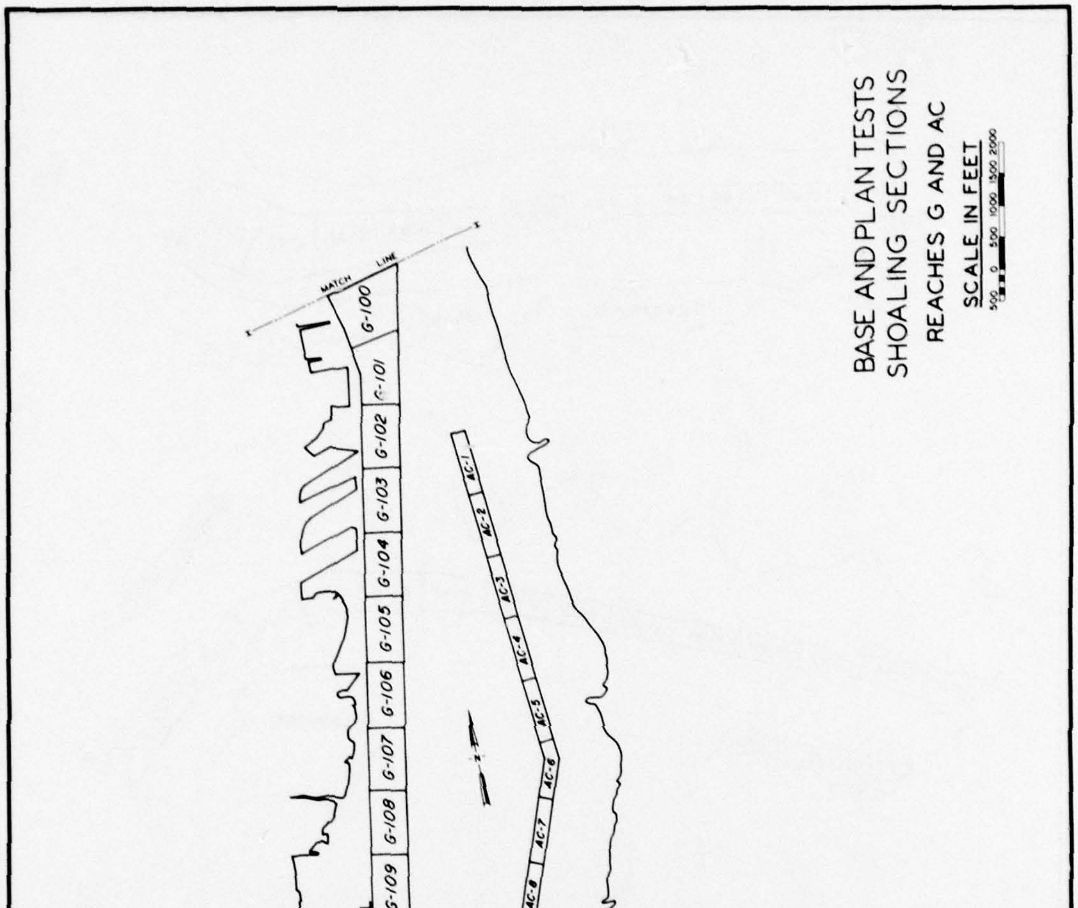
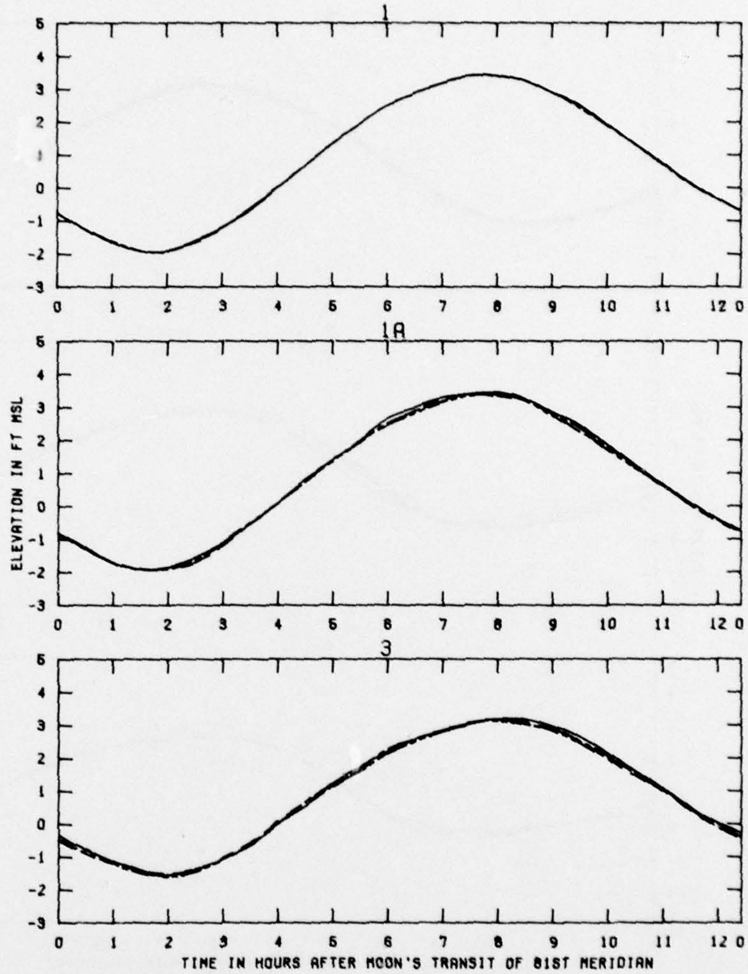

BASE AND PLAN TESTS
SHOALING SECTIONS
REACHES G AND AC
SCALE IN FEET
500 0 500 1000 1500 2000
JACKSONVILLE
TERMINAL CHANNEL
MATCH LINE
G-100
G-101
G-102
G-103
G-104
G-105
G-106
G-107
G-108
G-109
G-110
G-111
G-112
G-113
G-114
G-115
G-116
G-117
AC-1
AC-2
AC-3
AC-4
AC-5
AC-6
AC-7
AC-8
AC-9
AC-10
AC-11
AC-12
AC-13
AC-14
PEYTON ISLAND
EMPIRE PT.

PLATE 6



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT

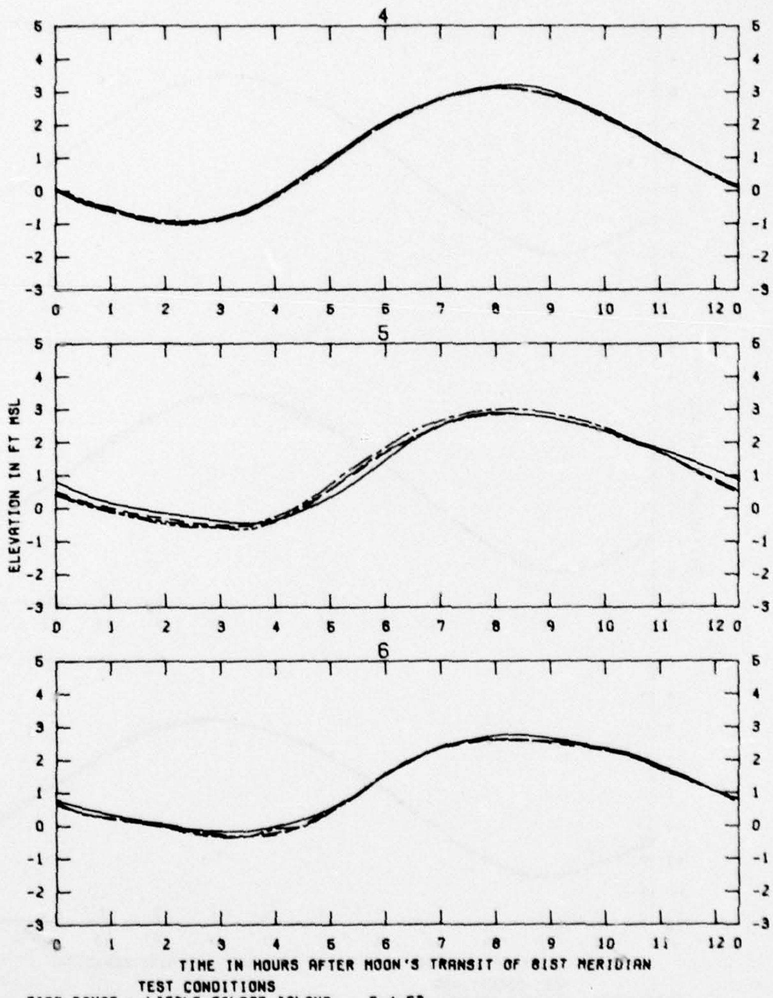
OCEAN SALINITY (TOTAL SALT) 33.0 PPT

FRESHWATER INFLOW 8940.0 CFS

EFFECTS OF
PLANS 15,18 AND 20
ON TIDAL HEIGHTS

STATIONS
1 . 1A . AND 3

PLATE 7



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS

LEGEND

- BASE ————
- PLAN 15 — — —
- PLAN 18 —·—
- PLAN 20 —··—

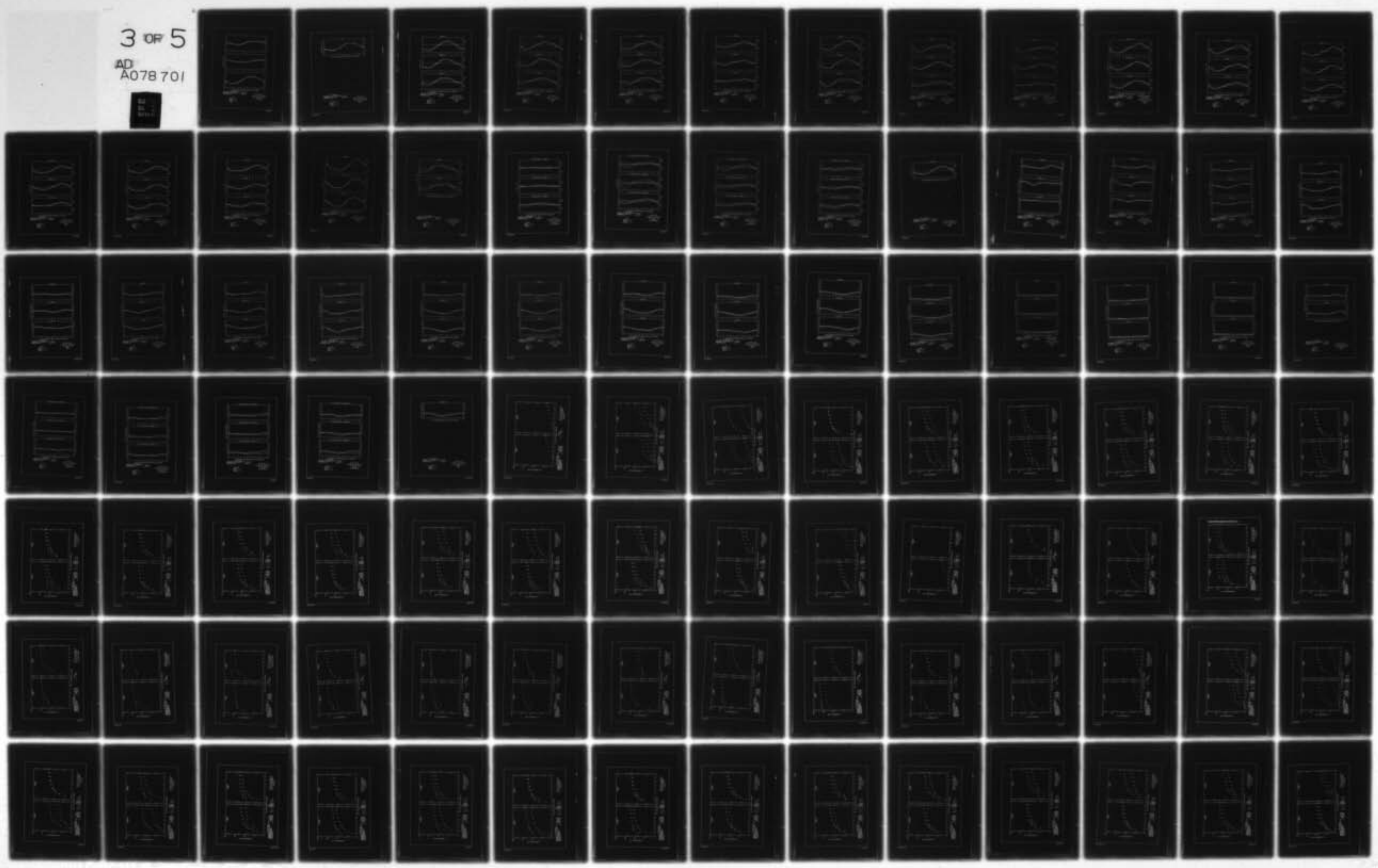
EFFECTS OF
PLANS 15.18 AND 20
ON TIDAL HEIGHTS

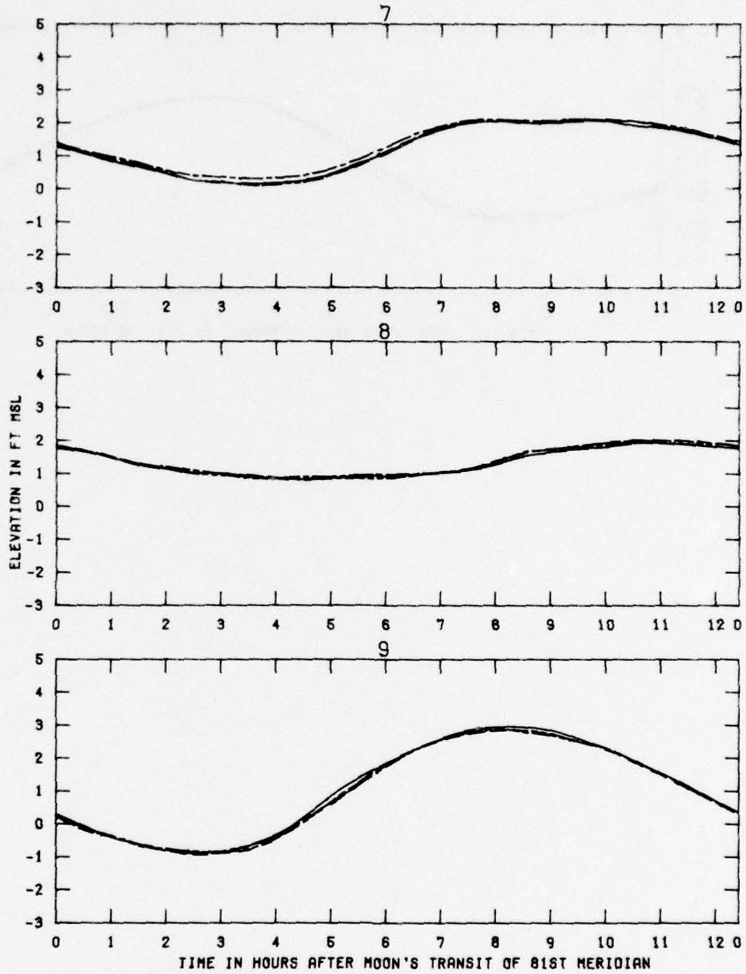
STATIONS
4 . 5 . AND 6

PLATE 8

AD-A078 701 ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG--ETC F/G 8/8
MAYPORT-MILL COVE MODEL STUDY. REPORT 3. MILL COVE STUDY. HYDRA--ETC(U)
SEP 79 N J BROGDON, J W PARMAN
UNCLASSIFIED WES/HL-79-12-3 NL

3 OF 5
AD
A078701





TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS

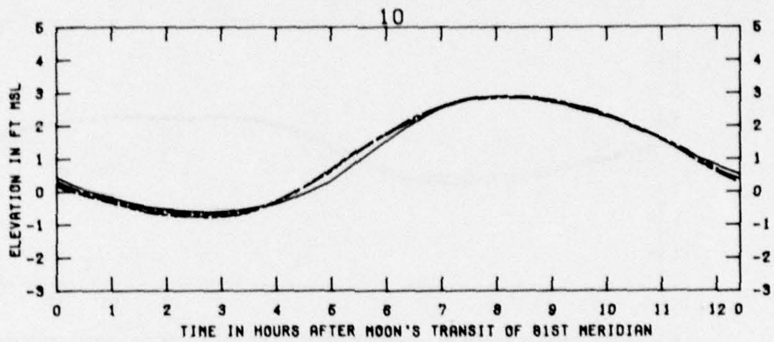
LEGEND

BASE
PLAN 15
PLAN 18
PLAN 20

EFFECTS OF
PLANS 15,18 AND 20
ON TIDAL HEIGHTS

STATIONS
7 , 8 , AND 9

PLATE 9



TEST CONDITIONS

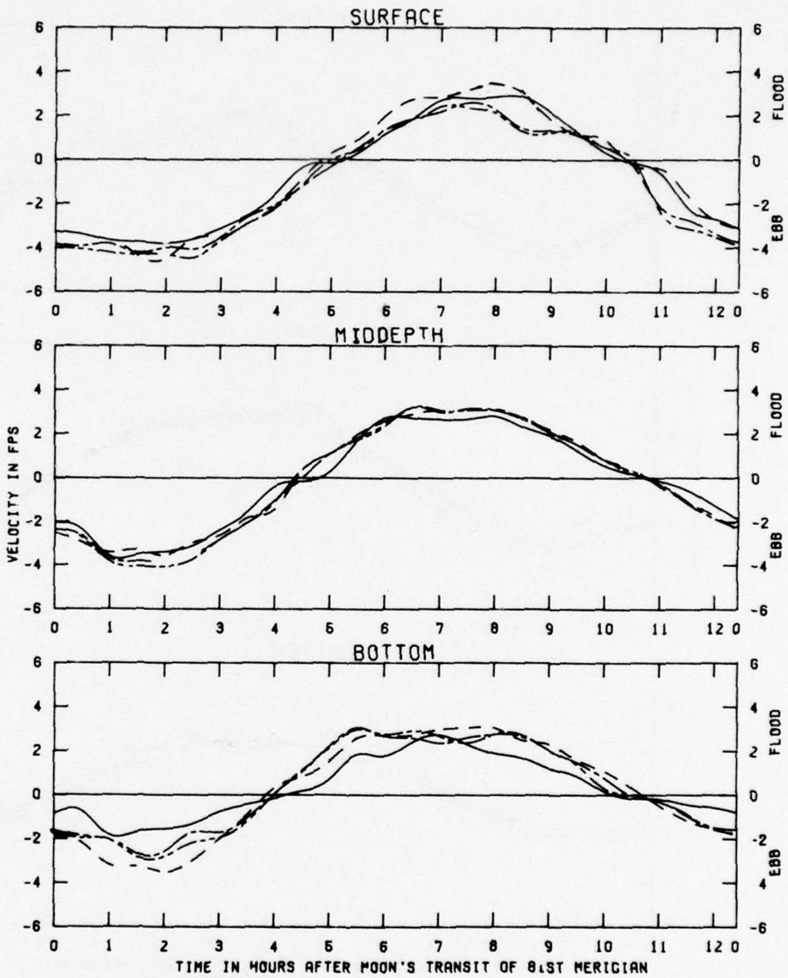
TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS

LEGEND
BASE ———
PLAN 15 — — —
PLAN 18 —·—
PLAN 20 —··—

EFFECTS OF
PLANS 15,18 AND 20
ON TIDAL HEIGHTS

STATION
10

PLATE 10



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS

LEGEND

BASE ———
PLAN 15 — — —
PLAN 18 —·—·—
PLAN 20 —··—··—

EFFECTS OF
PLANS 15, 18 AND 20
ON VELOCITIES

STATION
3A

PLATE 11

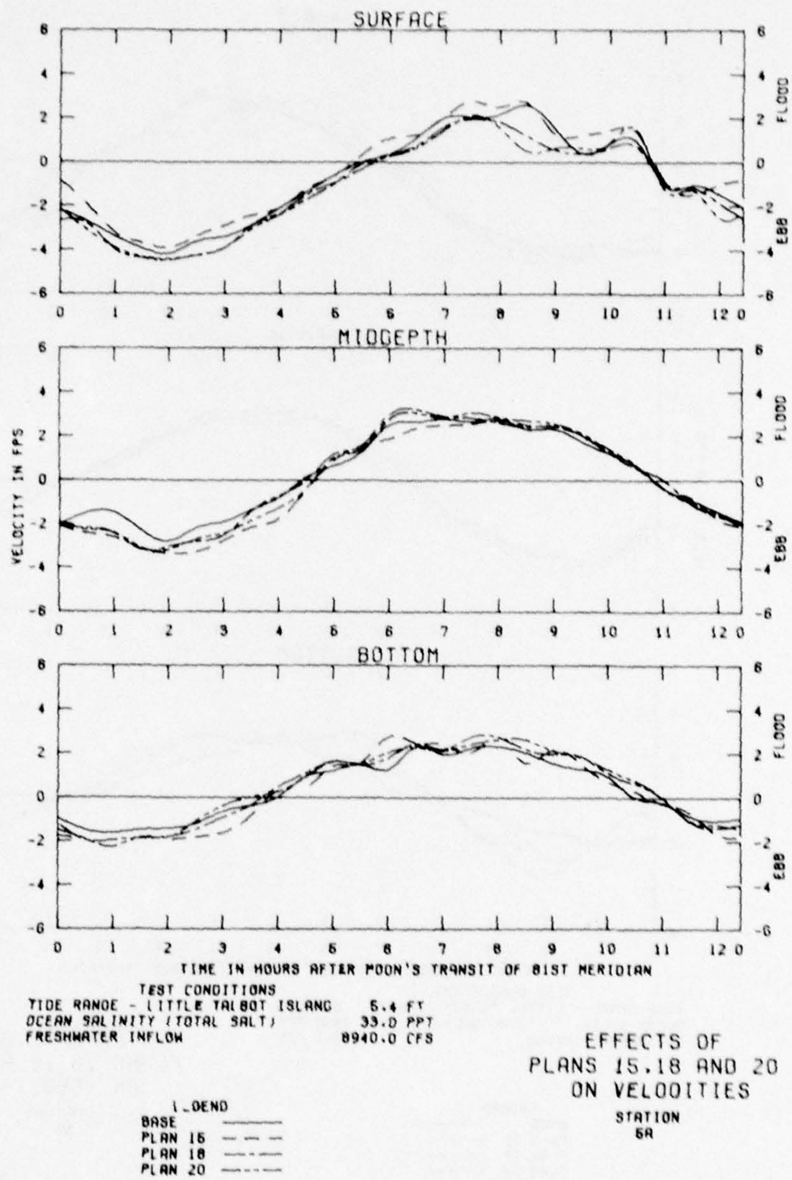
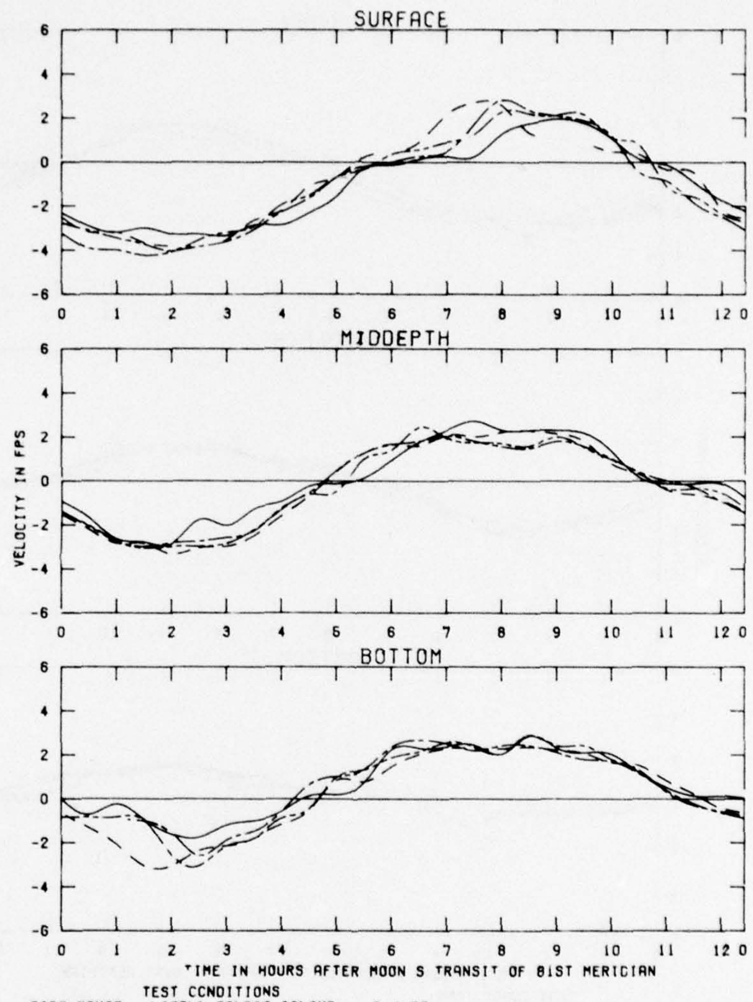

SURFACE
MIDDEPTH
BOTTOM
VELOCITY IN FPS
FLOOD
EBB
TIME IN HOURS AFTER MOON'S TRANSIT OF 81ST MERIDIAN
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
LEGEND
BASE
PLAN 15
PLAN 18
PLAN 20
EFFECTS OF
PLANS 15,18 AND 20
ON VELOCITIES
STATION
6A

PLATE 12



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS

LEGEND
BASE ———
PLAN 15 — — —
PLAN 18 —·—·—
PLAN 20 —··—··—

EFFECTS OF
PLANS 15,18 AND 20
ON VELOCITIES

STATION
7B

PLATE 13

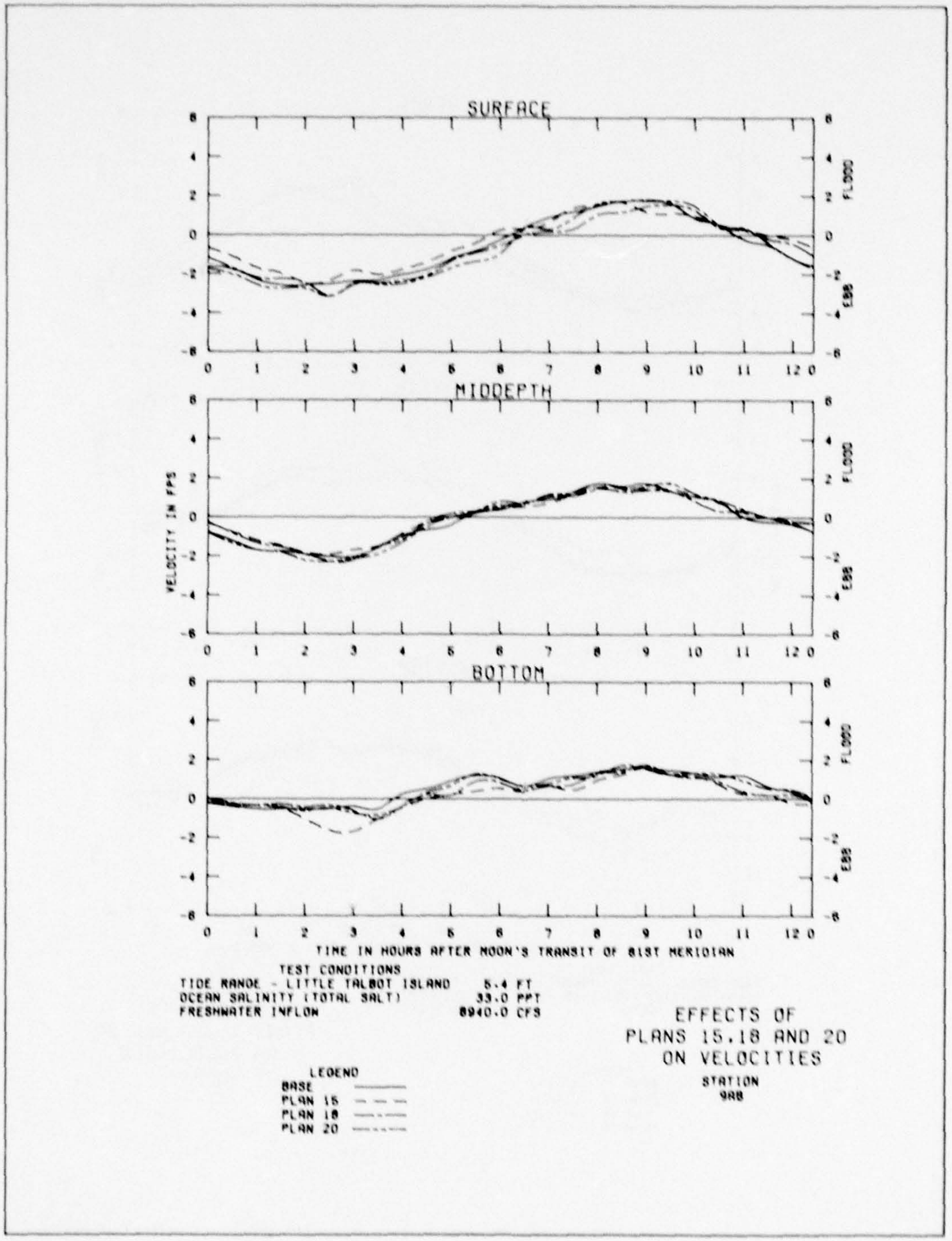
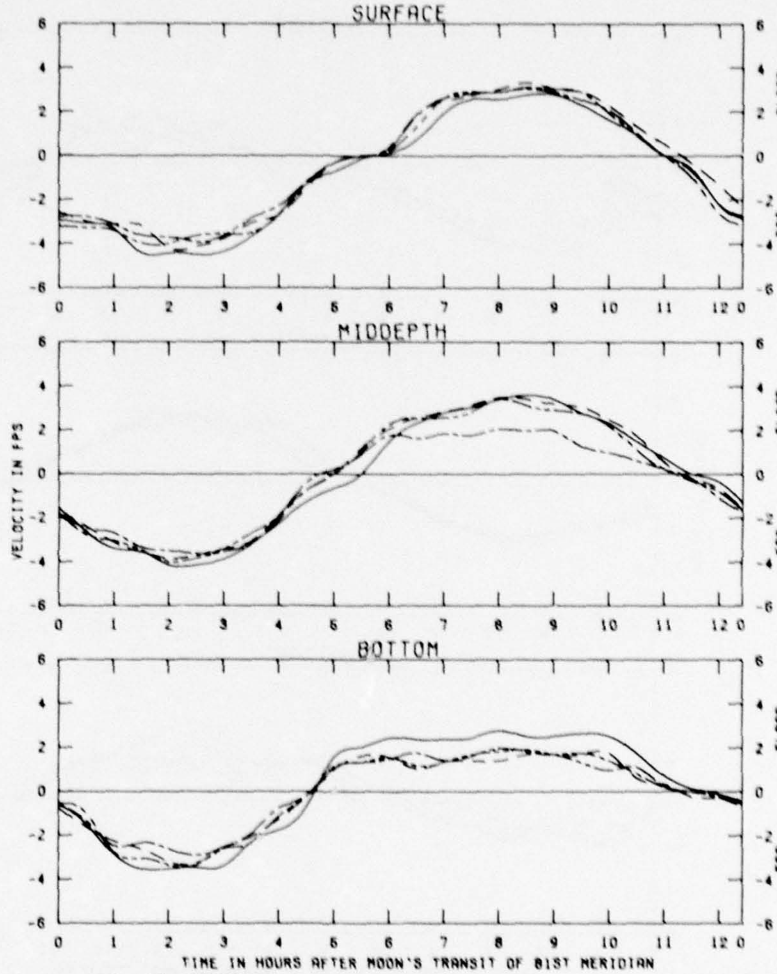

SURFACE
MIDDEPTH
BOTTOM
VELOCITY IN FPS
FLOOD
EBB
TIME IN HOURS AFTER MOON'S TRANSIT OF 81ST MERIDIAN
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
LEGEND
BASE
PLAN 15
PLAN 18
PLAN 20
EFFECTS OF
PLANS 15.18 AND 20
ON VELOCITIES
STATION
9AB

PLATE 14



TEST CONDITIONS

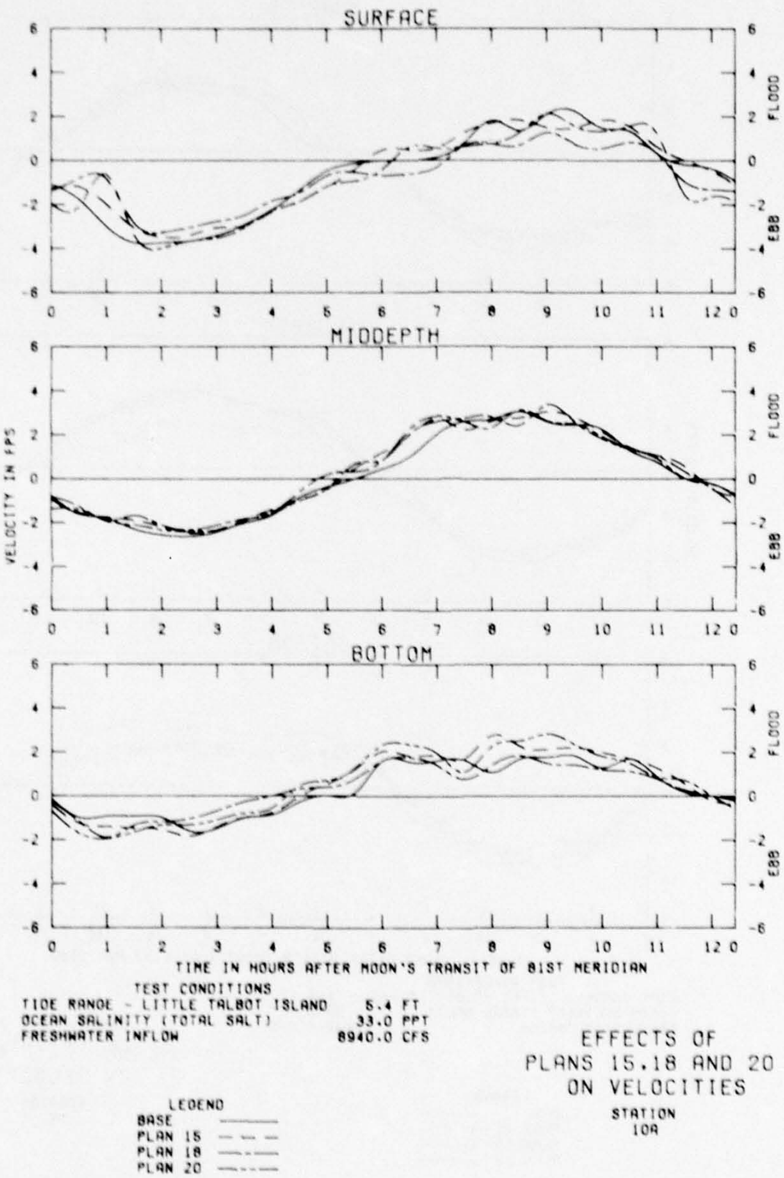
TIDE RANGE - LITTLE TALBOT ISLAND 6.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS

LEGEND

BASE
PLAN 15
PLAN 18
PLAN 20

EFFECTS OF
PLANS 15,18 AND 20
ON VELOCITIES

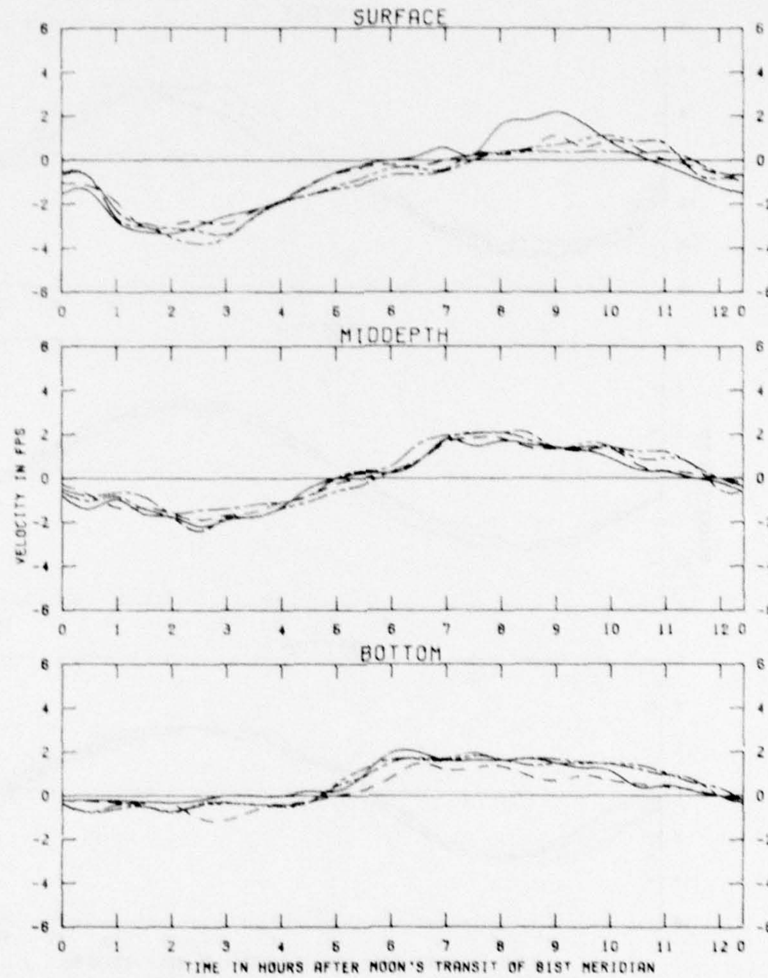
STATION
9B



EFFECTS OF
PLANS 15.18 AND 20
ON VELOCITIES

STATION
10A

PLATE 16



TEST CONDITIONS

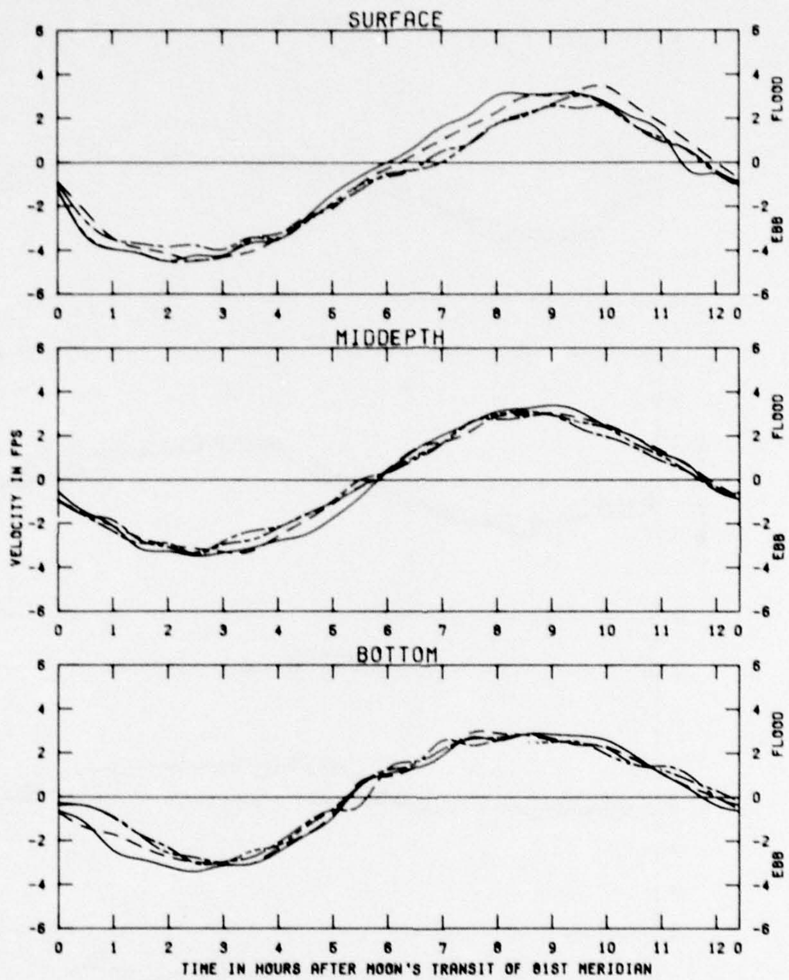
TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS

MAYPORT-MILL COVE MODEL
MILL COVE STUDY

EFFECTS OF
PLANS 15.18 AND 20
ON VELOCITIES

STATION
10.5

LEGEND
BASE ————
PLAN 15 — — —
PLAN 18 —·—·—
PLAN 20 —··—··—



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS

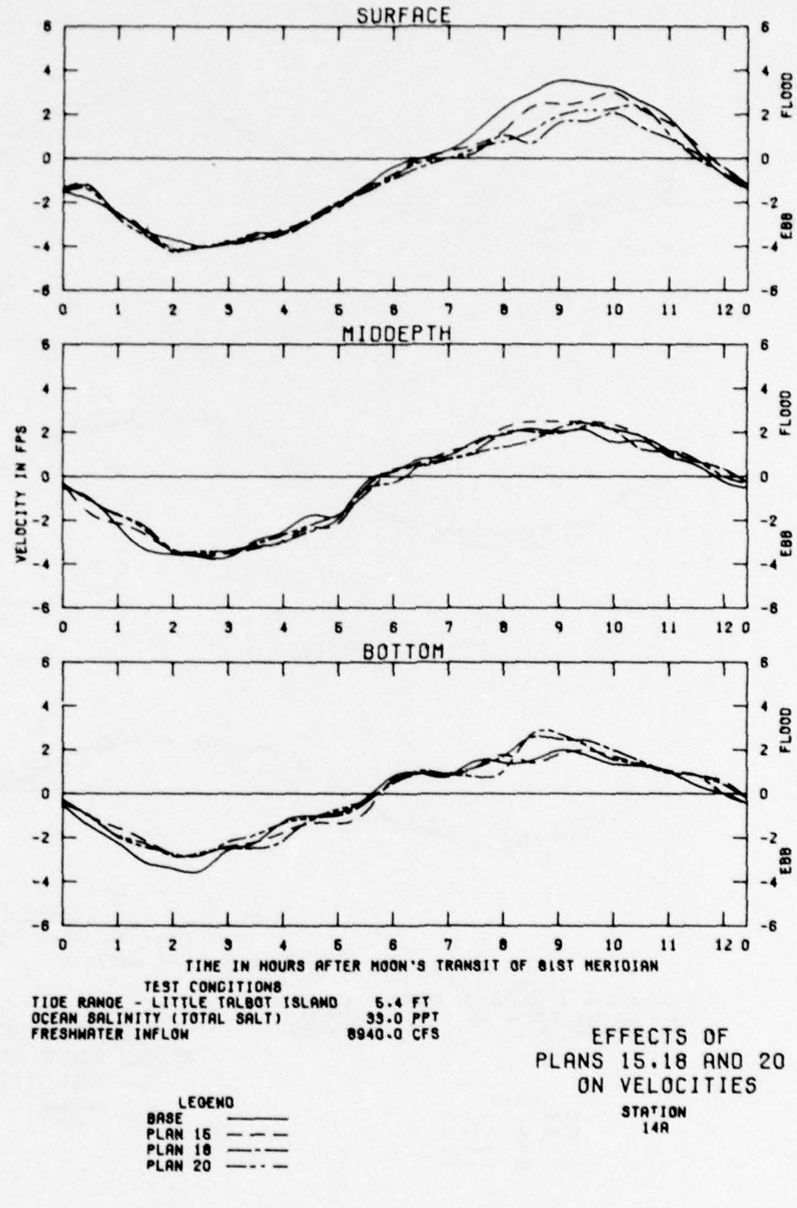
LEGEND
BASE
PLAN 15
PLAN 18
PLAN 20

MAYPORT-MILL COVE MODEL
MILL COVE STUDY

EFFECTS OF
PLANS 15,18 AND 20
ON VELOCITIES

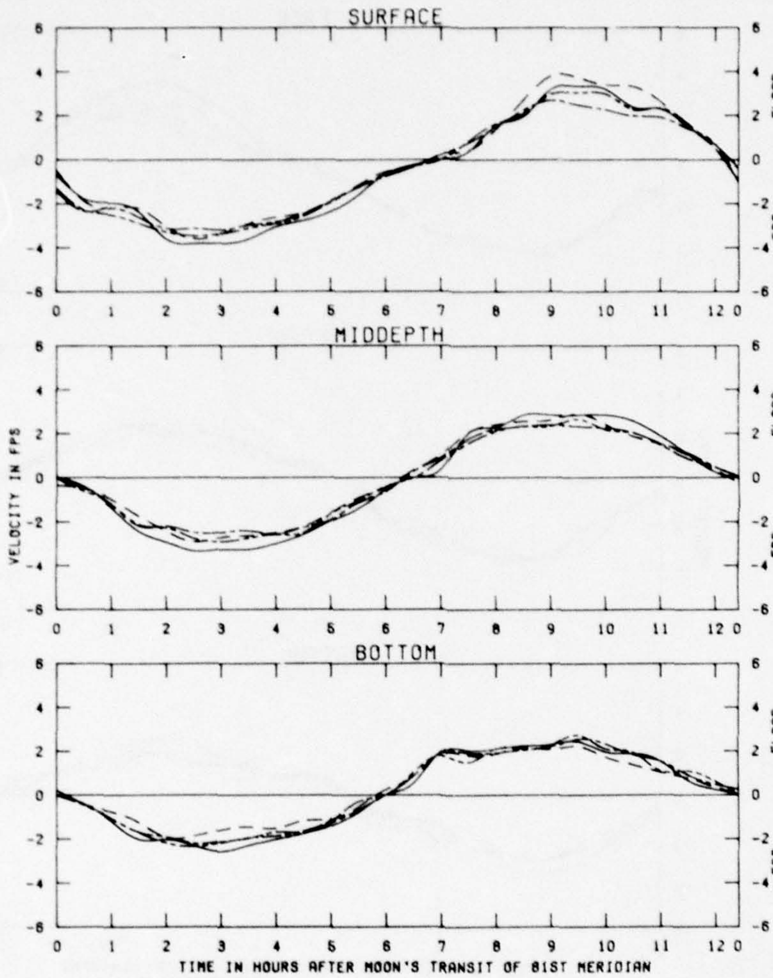
STATION
12A

PLATE 18



EFFECTS OF
PLANS 15, 18 AND 20
ON VELOCITIES

PLATE 19



TEST CONDITIONS

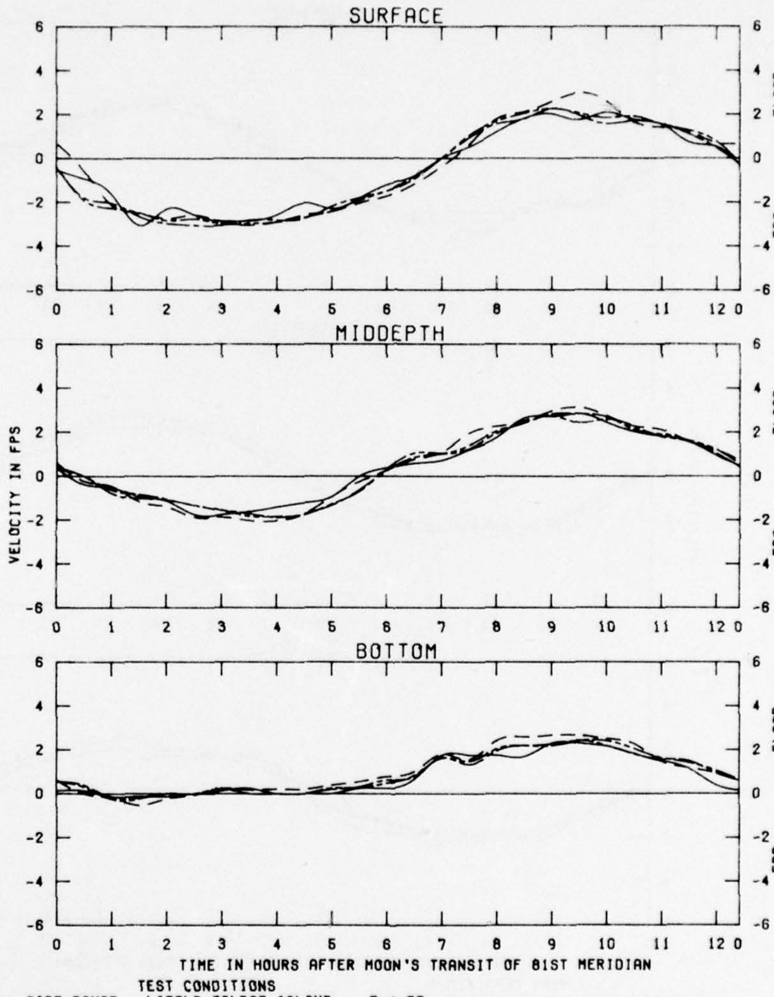
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS

LEGEND

BASE
PLAN 15
PLAN 18
PLAN 20

EFFECTS OF
PLANS 15.18 AND 20
ON VELOCITIES

STATION
16A



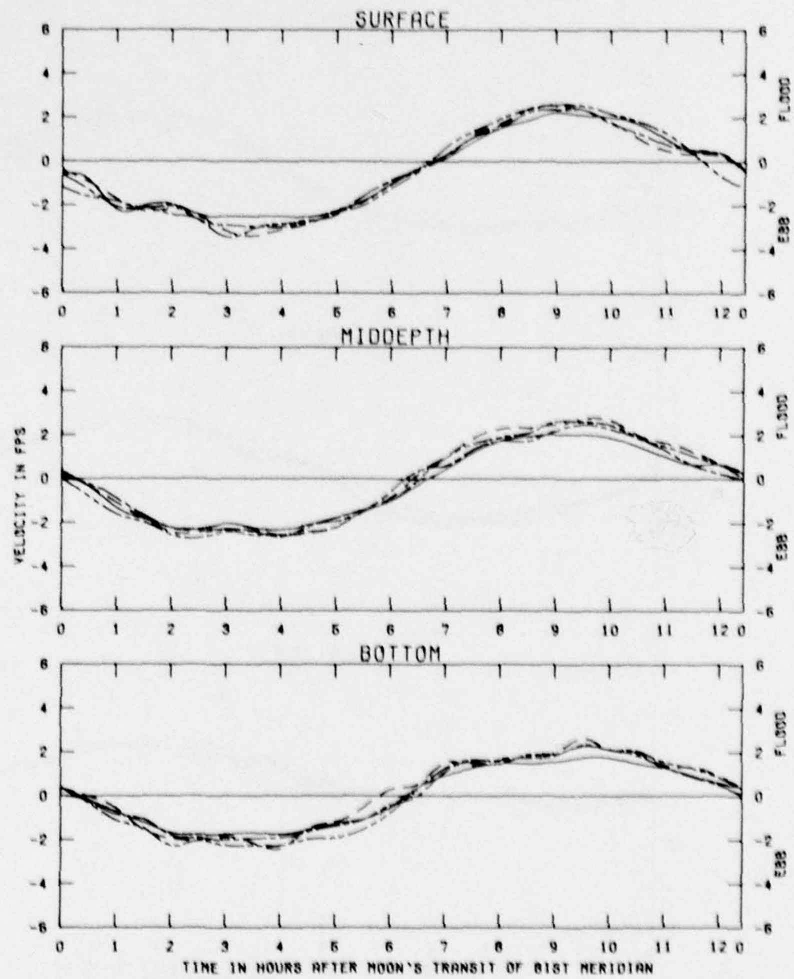
TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS

EFFECTS OF
PLANS 15,18 AND 20
ON VELOCITIES

STATION
18A

LEGEND
BASE ————
PLAN 15 — — —
PLAN 18 —·—·—
PLAN 20 —··—··—



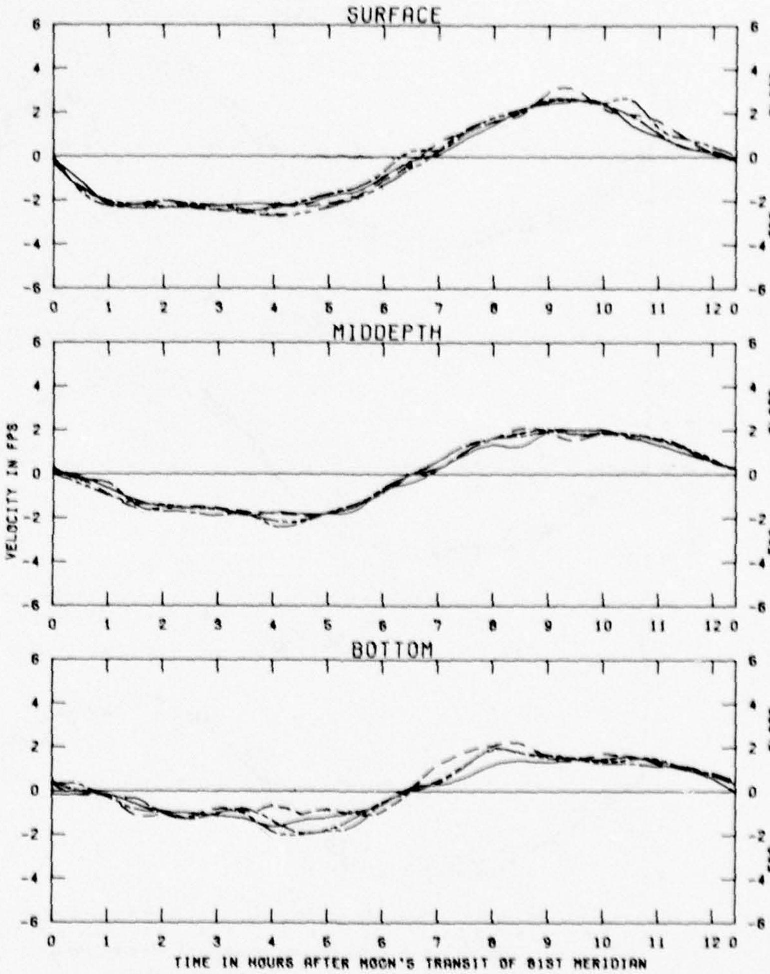
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS

LEGEND
BASE
PLAN 15
PLAN 18
PLAN 20

EFFECTS OF
PLANS 15,18 AND 20
ON VELOCITIES

STATION
20A

PLATE 22



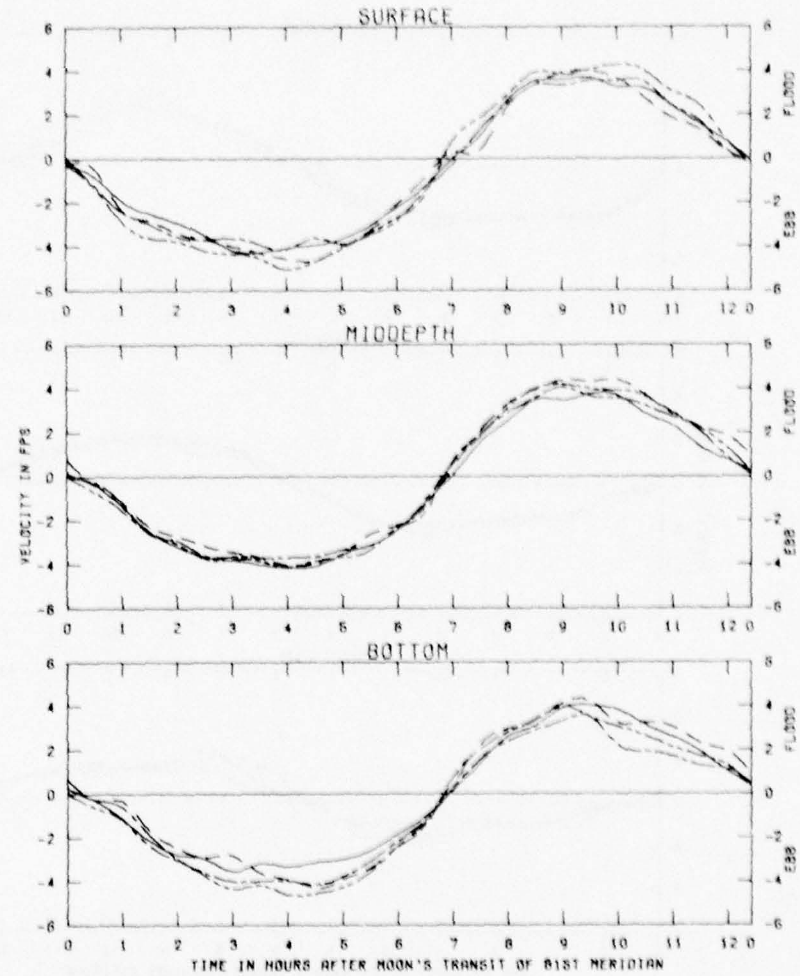
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS

LEGEND
BASE
PLAN 15
PLAN 18
PLAN 20

EFFECTS OF
PLANS 15.18 AND 20
ON VELOCITIES

STATION
218

PLATE 23



TEST CONDITIONS

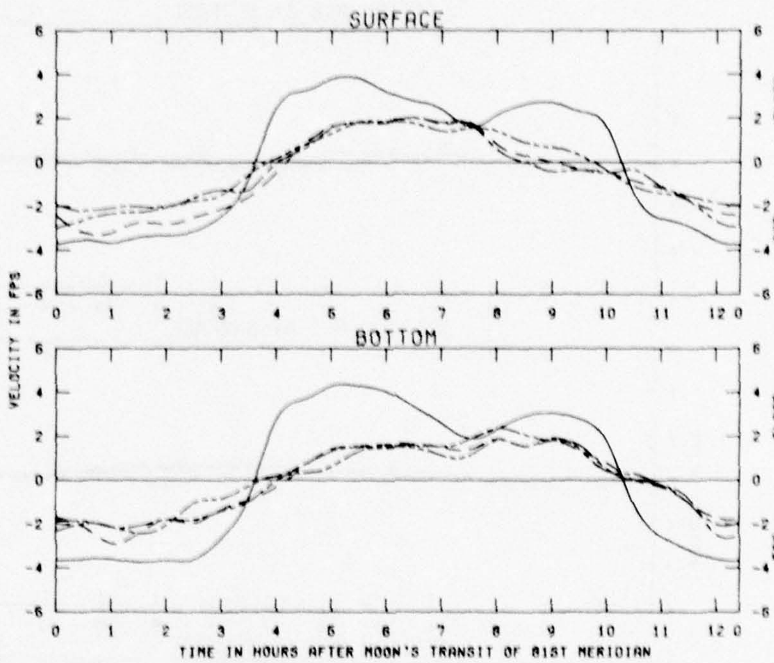
TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS

LEGEND
BASE
PLAN 15
PLAN 18
PLAN 20

EFFECTS OF
PLANS 15,18 AND 20
ON VELOCITIES

STATION
24A

PLATE 24



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS

LEGEND

BASE ———
PLAN 15 — — —
PLAN 18 —·—·—
PLAN 20 —··—··—

EFFECTS OF
PLANS 15.18 AND 20
ON VELOCITIES

STATION
MCA

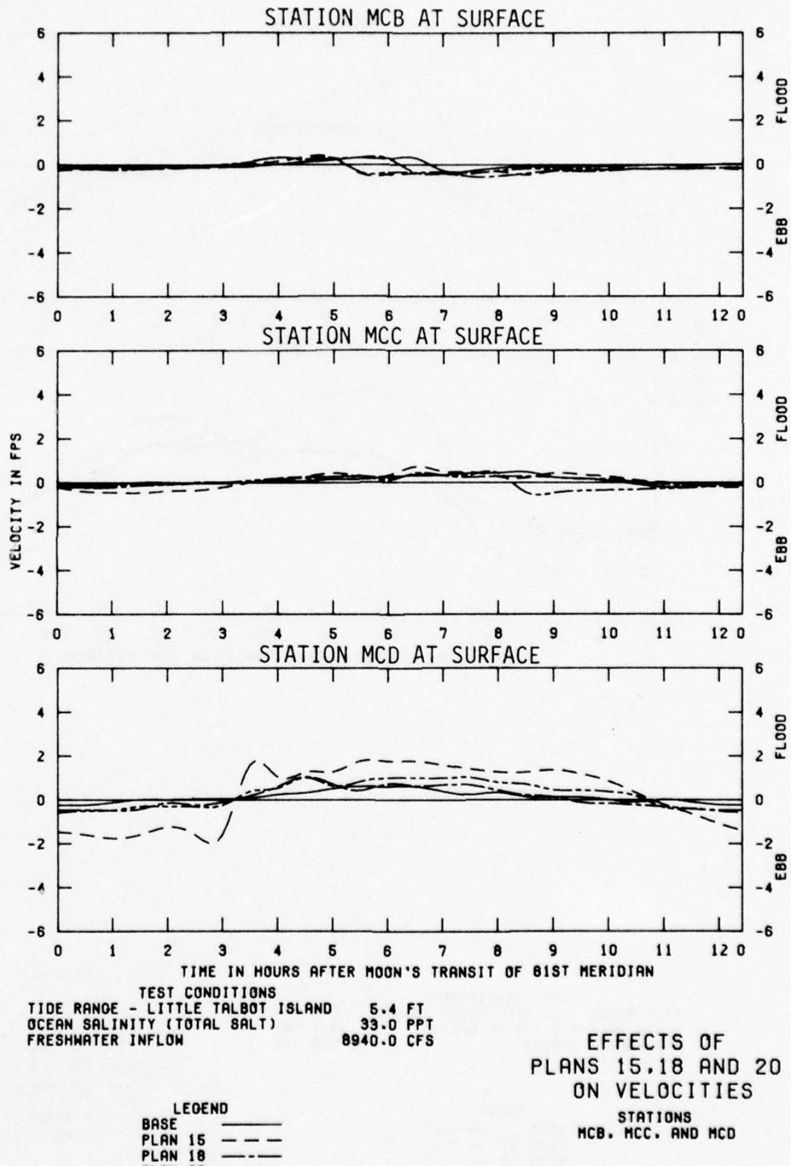
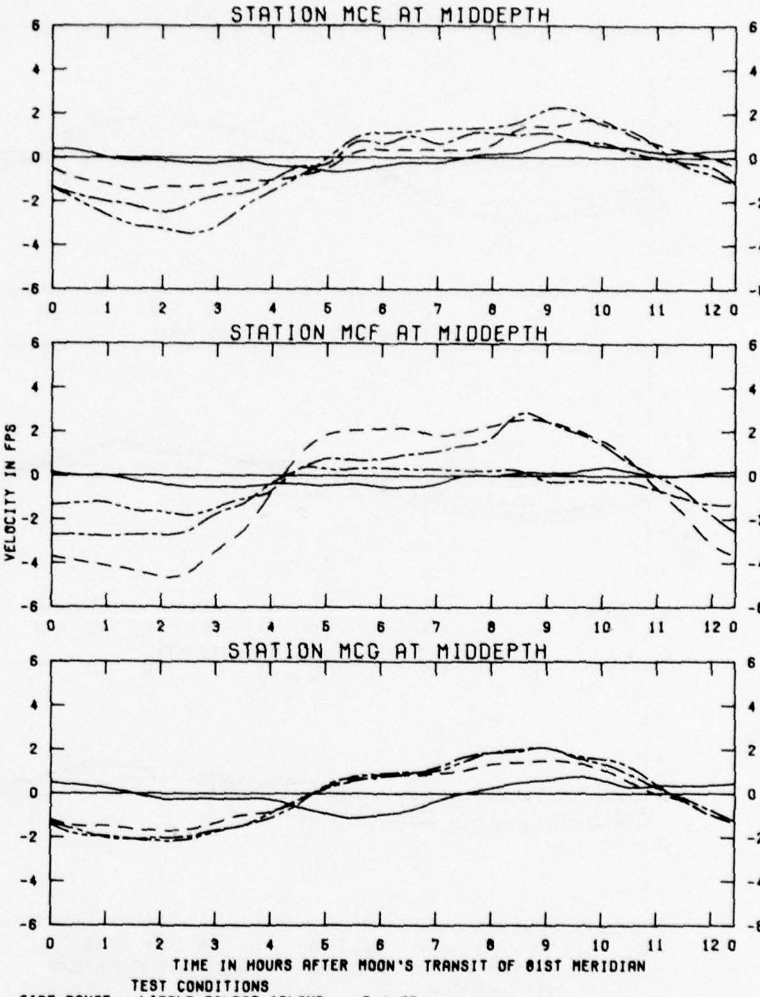

STATION MCB AT SURFACE
STATION MCC AT SURFACE
STATION MCD AT SURFACE
VELOCITY IN FPS
FLOOD
EBB
TIME IN HOURS AFTER MOON'S TRANSIT OF 81ST MERIDIAN
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
LEGEND
BASE
PLAN 15
PLAN 18
PLAN 20
EFFECTS OF
PLANS 15,18 AND 20
ON VELOCITIES
STATIONS
MCB, MCC, AND MCD

PLATE 26



TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS

LEGEND
BASE
PLAN 15
PLAN 18
PLAN 20

EFFECTS OF
PLANS 15,18 AND 20
ON VELOCITIES
STATIONS
MCE, MCF, AND MCG

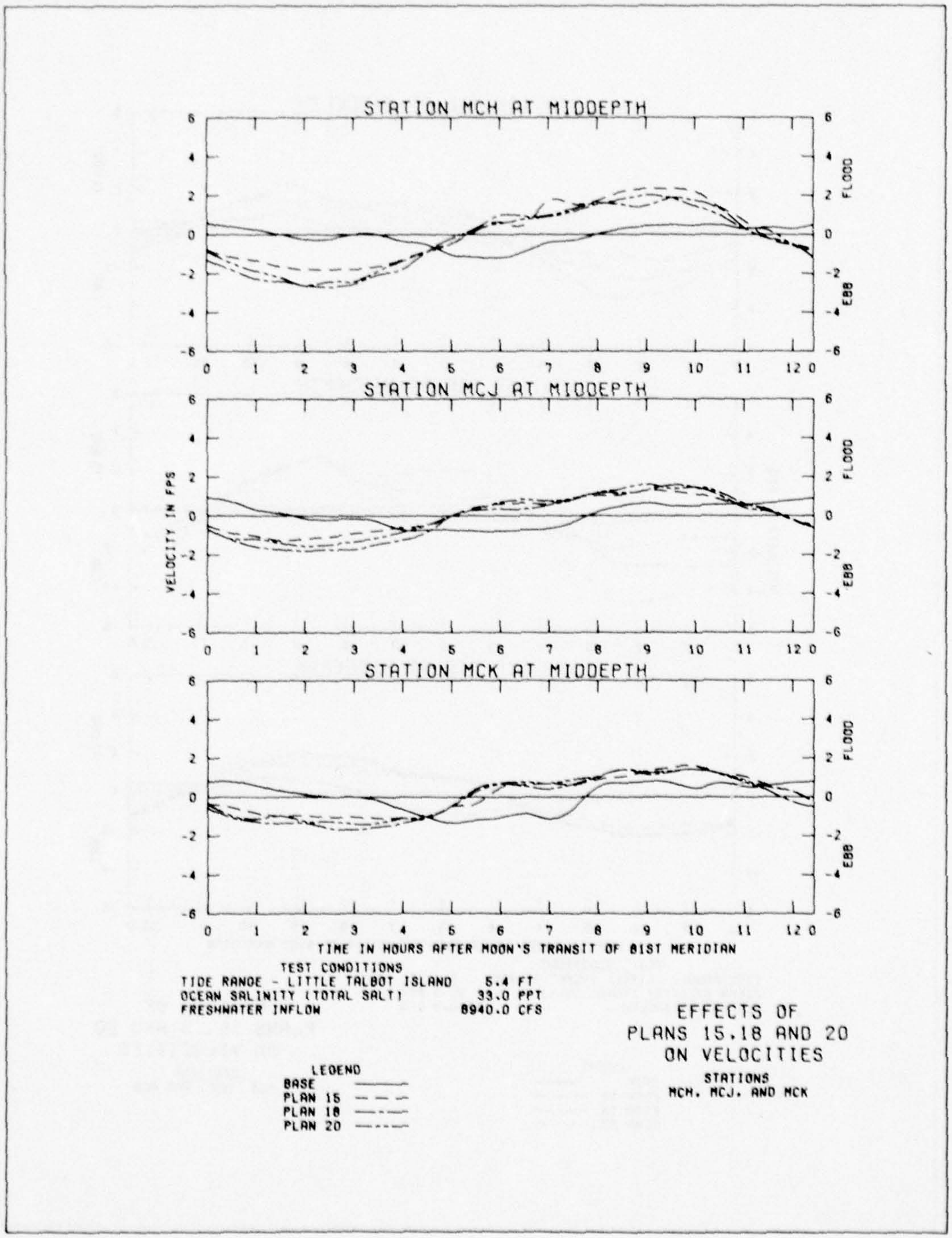
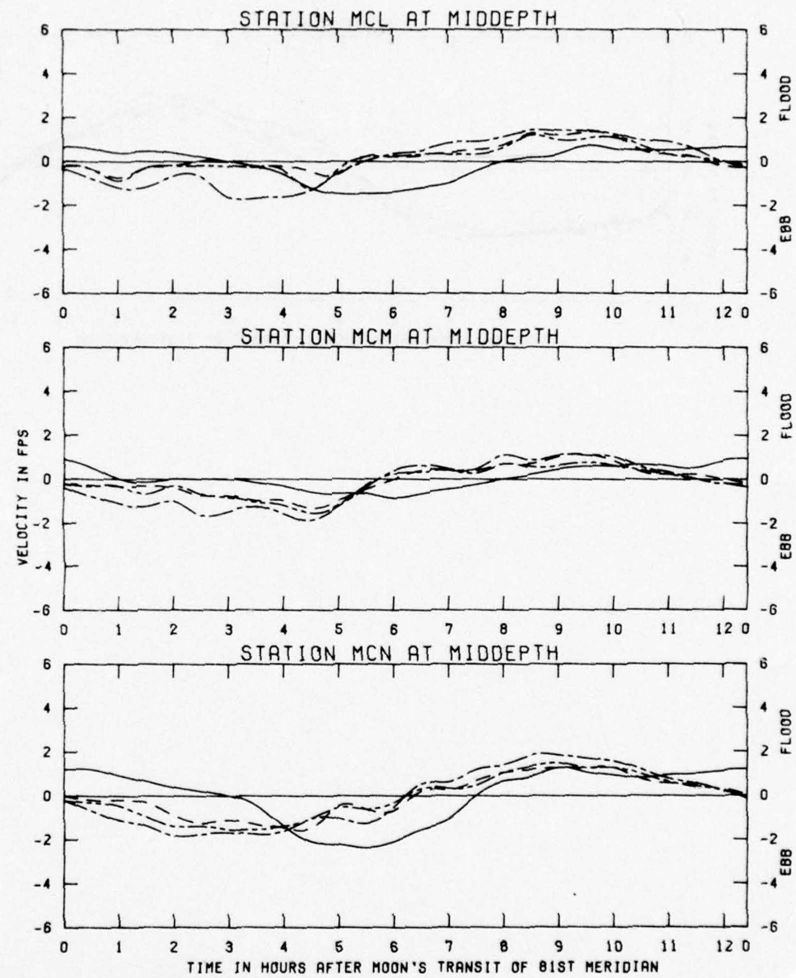

STATION MCH AT MIDDEPTH
STATION MCJ AT MIDDEPTH
STATION MCK AT MIDDEPTH
VELOCITY IN FPS
FLOOD
EBB
TIME IN HOURS AFTER MOON'S TRANSIT OF 81ST MERIDIAN
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
LEGEND
BASE
PLAN 15
PLAN 18
PLAN 20
EFFECTS OF
PLANS 15, 18 AND 20
ON VELOCITIES
STATIONS
MCH, MCJ, AND MCK

PLATE 28



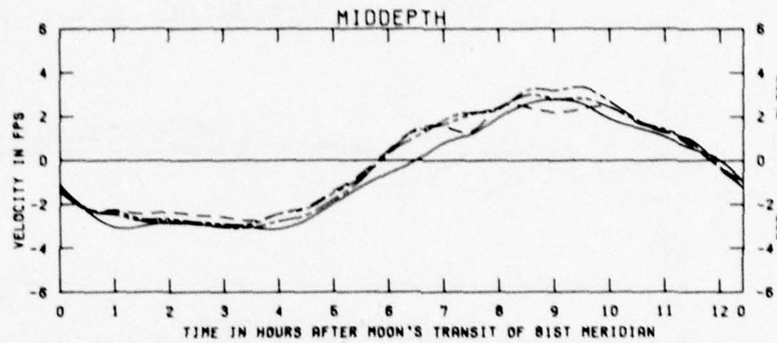
TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS

LEGEND
BASE
PLAN 15
PLAN 18
PLAN 20

EFFECTS OF
PLANS 15,18 AND 20
ON VELOCITIES

STATIONS
MCL, MCM, AND MCN



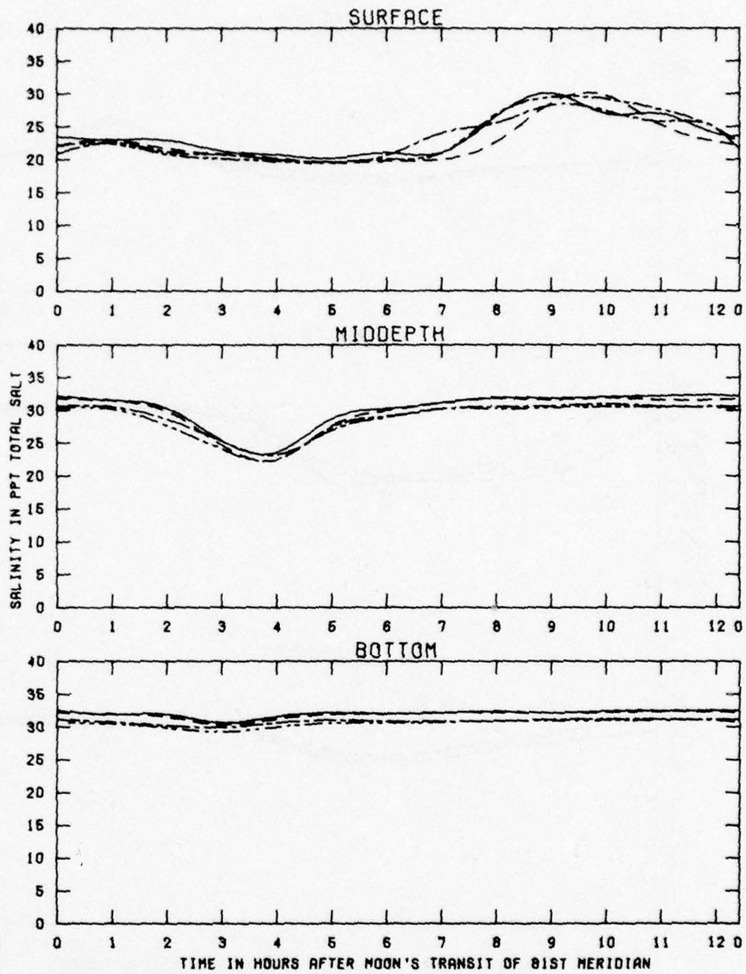
TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS

LEGEND
BASE ———
PLAN 15 — — —
PLAN 18 —·—·—
PLAN 20 —··—··—

EFFECTS OF
PLANS 15,18 AND 20
ON VELOCITIES

STATION
MCP



TEST CONDITIONS

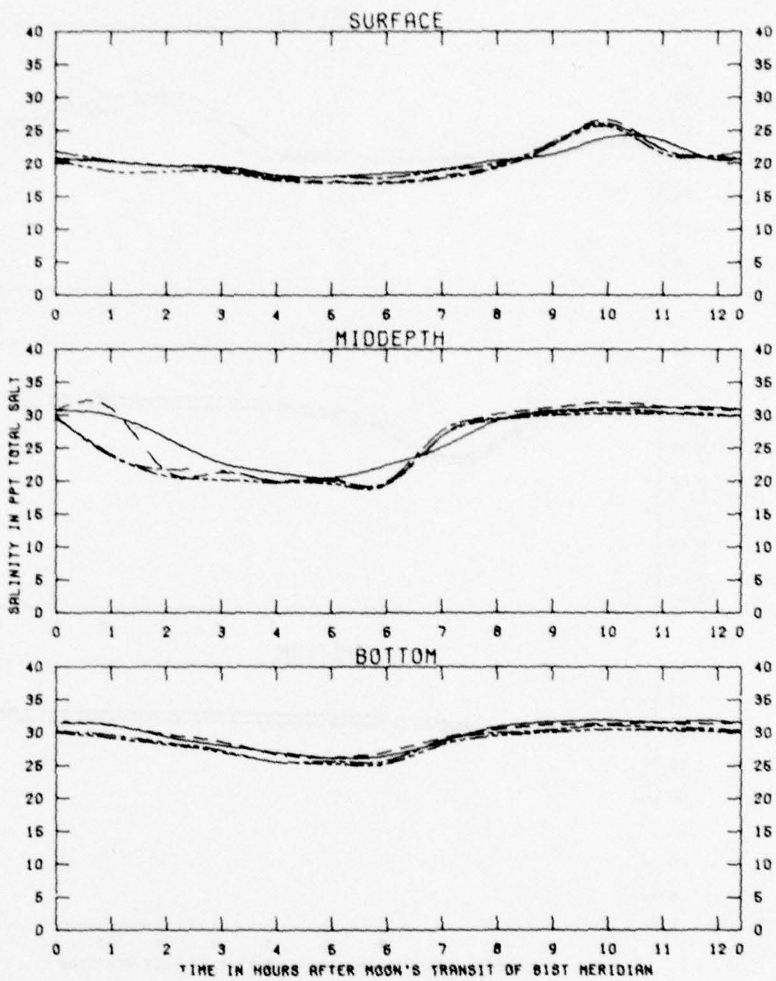
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS

LEGEND

BASE ————
PLAN 15 — — —
PLAN 18 —·—·—
PLAN 20 —··—··—

EFFECTS OF
PLANS 15,18 AND 20
ON SALINITIES

STATION
08



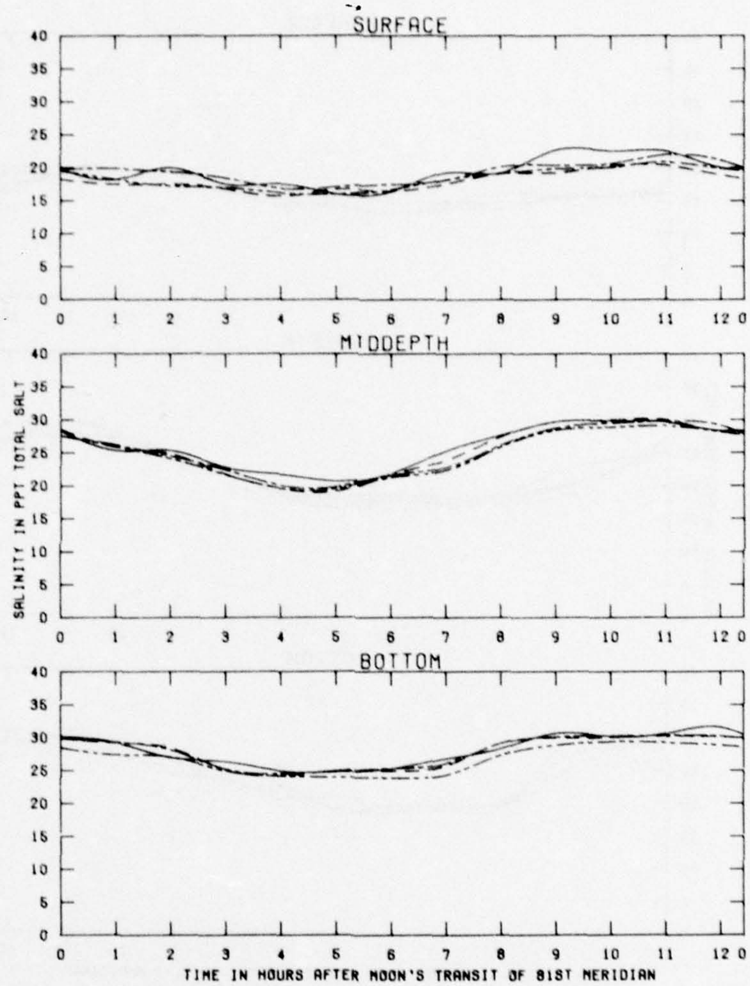
TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS

EFFECTS OF
PLANS 15,18 AND 20
ON SALINITIES

STATION
3A

LEGEND
BASE ————
PLAN 15 — — —
PLAN 18 —·—·—
PLAN 20 —··—··—



TEST CONDITIONS

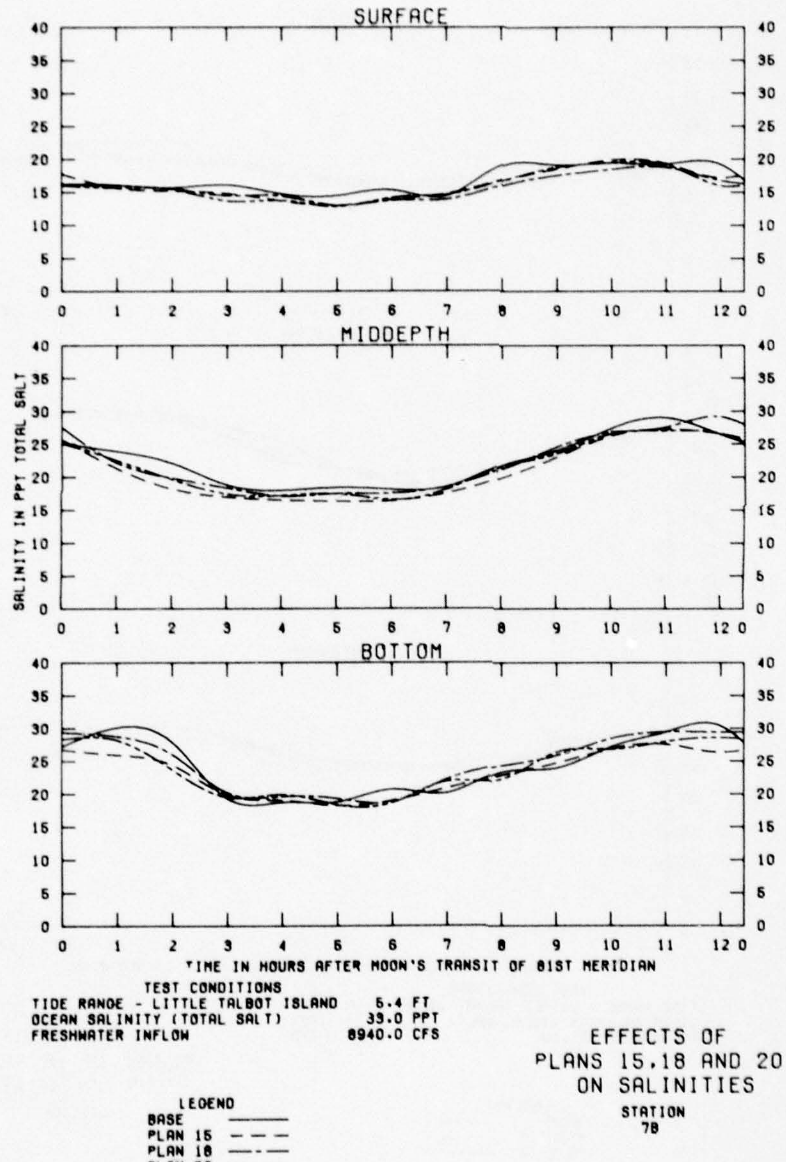
TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS

LEGEND
BASE ———
PLAN 15 — — —
PLAN 18 —·—·—
PLAN 20 —··—··—

EFFECTS OF
PLANS 15,18 AND 20
ON SALINITIES

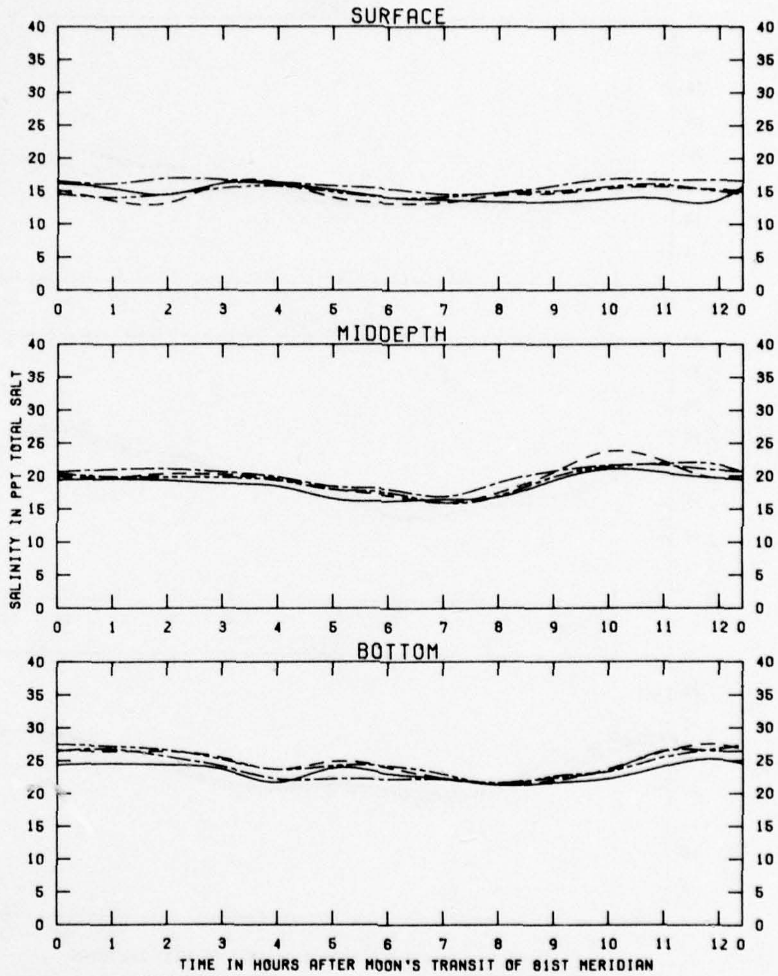
STATION
5A

PLATE 33



EFFECTS OF
PLANS 15,18 AND 20
ON SALINITIES
STATION
78

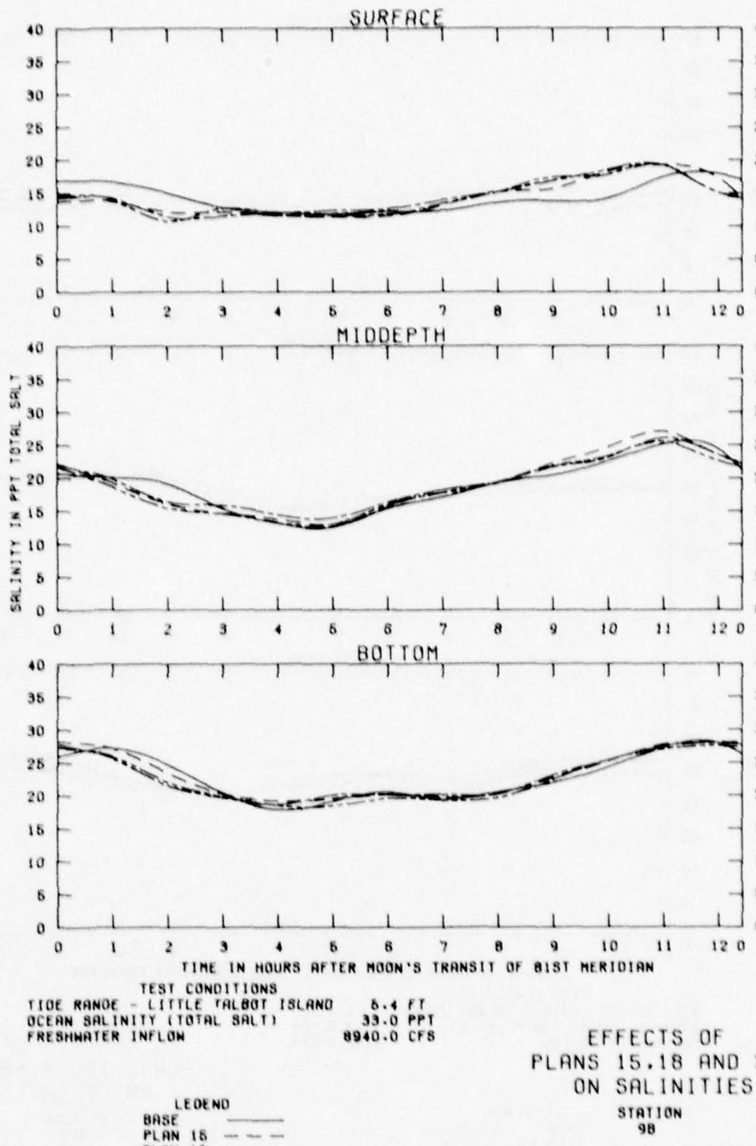
PLATE 34



TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS

EFFECTS OF
PLANS 15,18 AND 20
ON SALINITIES

STATION
9AB



EFFECTS OF
PLANS 15,18 AND 20
ON SALINITIES

STATION
9B

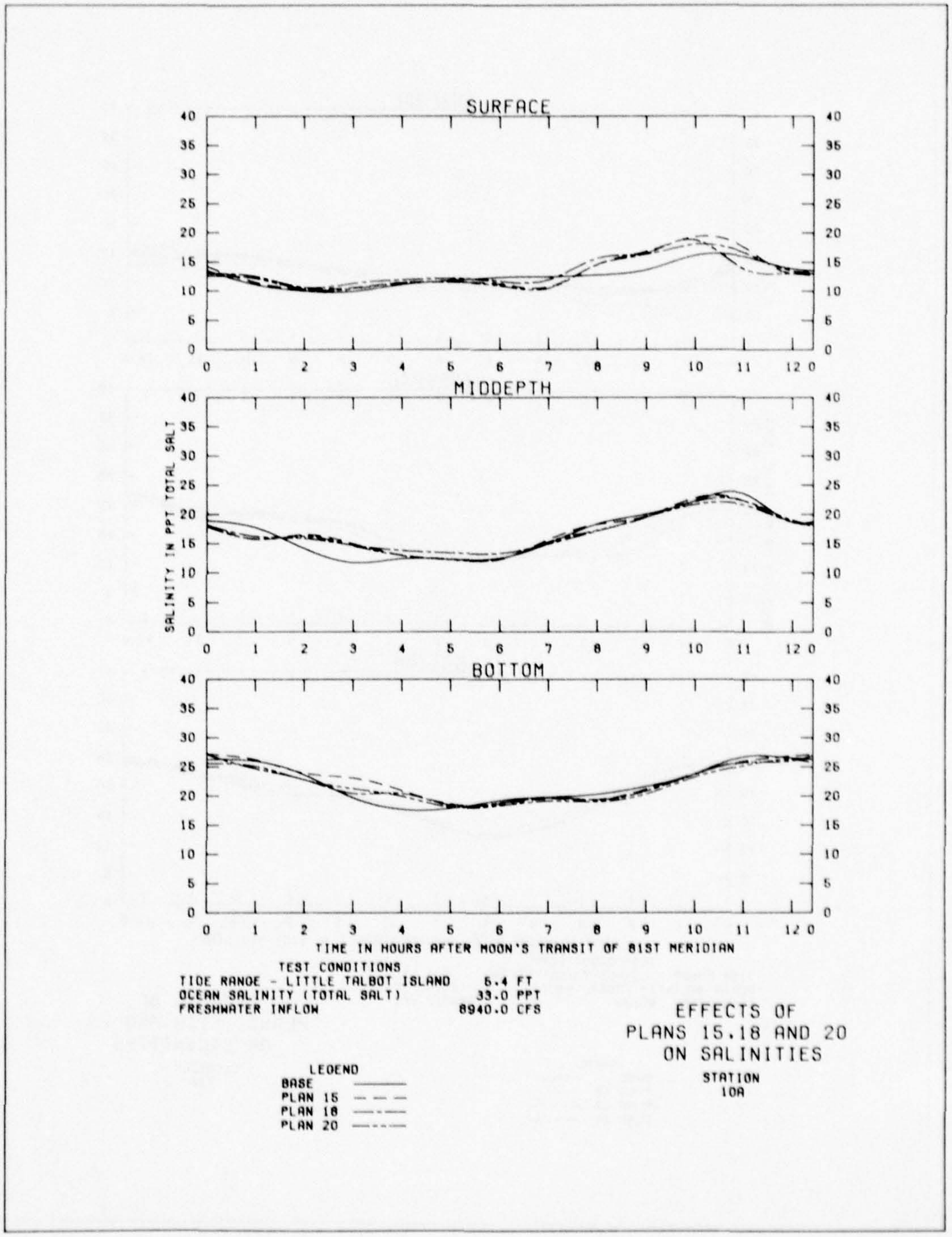
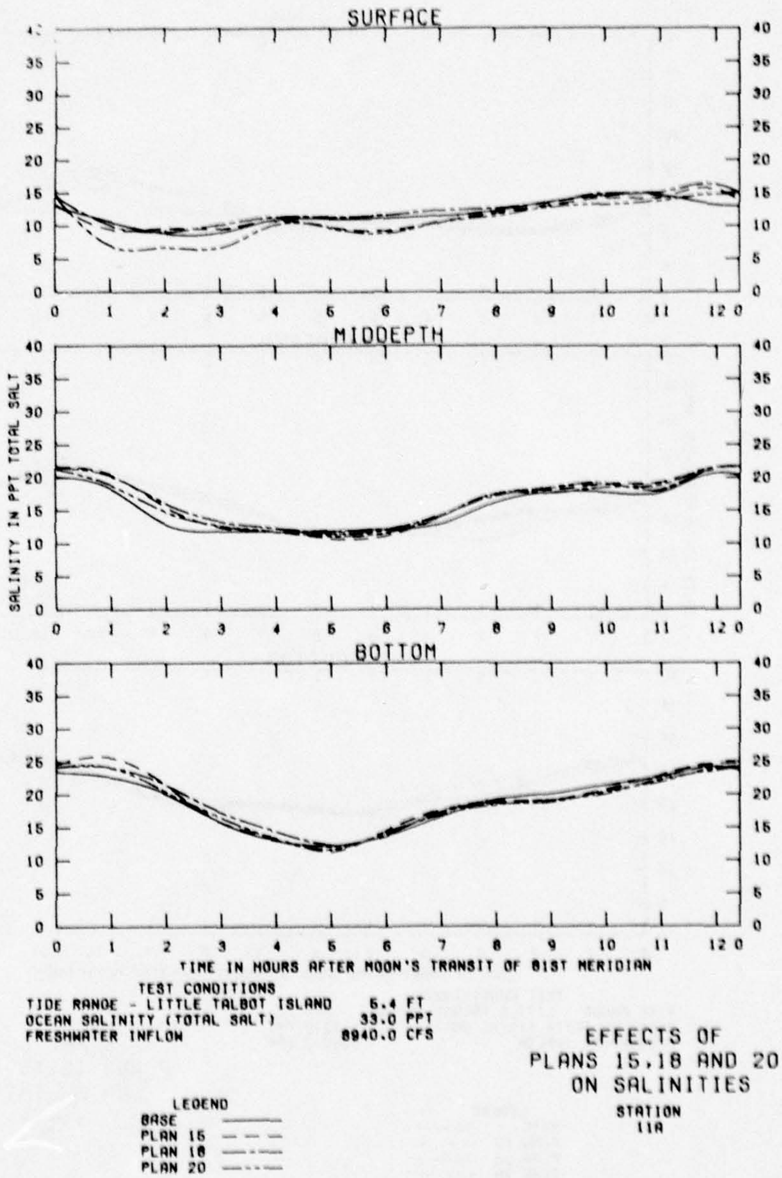
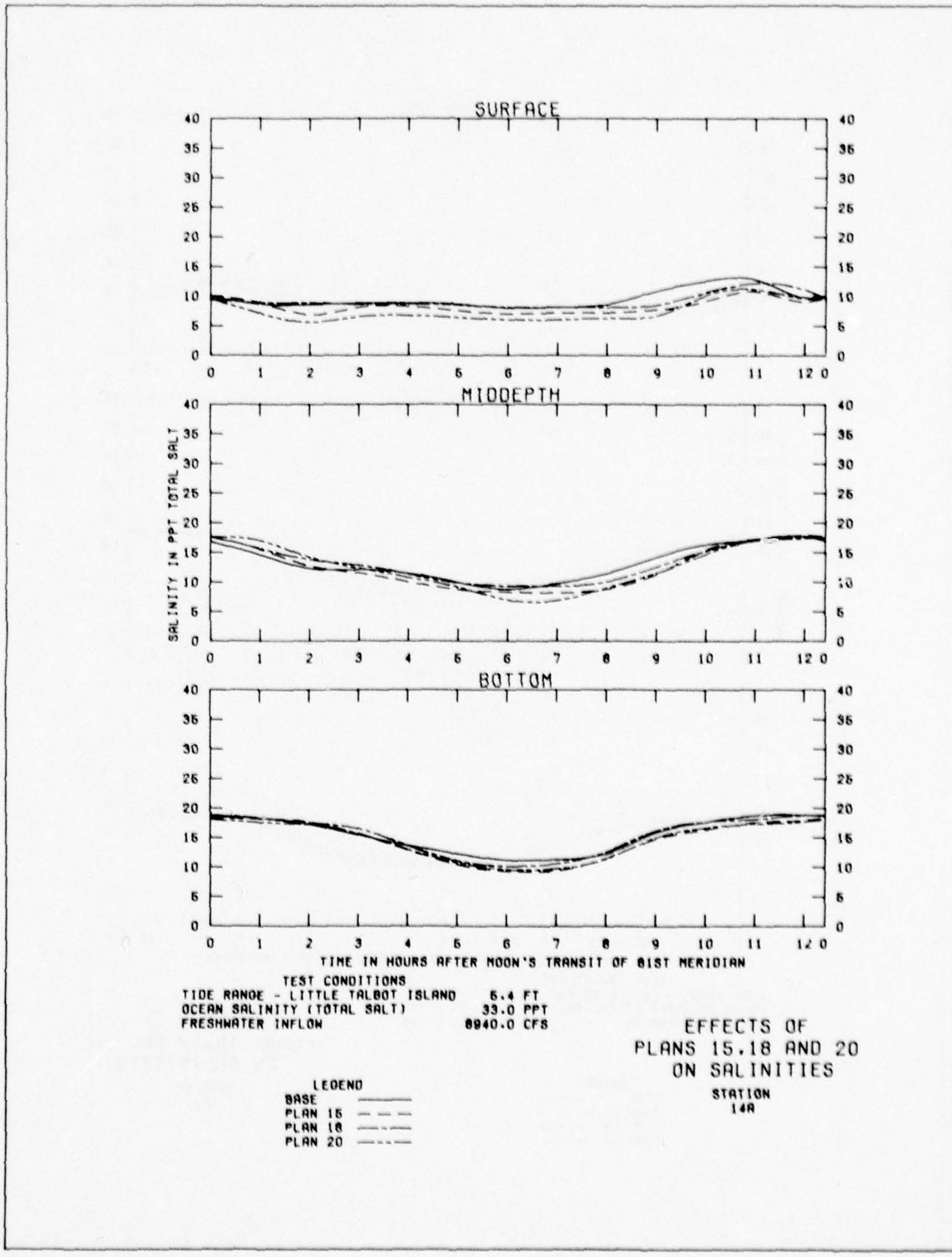

SURFACE
MIDDEPTH
BOTTOM
SALINITY IN PPT TOTAL SALT
TIME IN HOURS AFTER MOON'S TRANSIT OF 81ST MERIDIAN
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
EFFECTS OF
PLANS 15.18 AND 20
ON SALINITIES
STATION
10A
LEGEND
BASE
PLAN 15
PLAN 18
PLAN 20

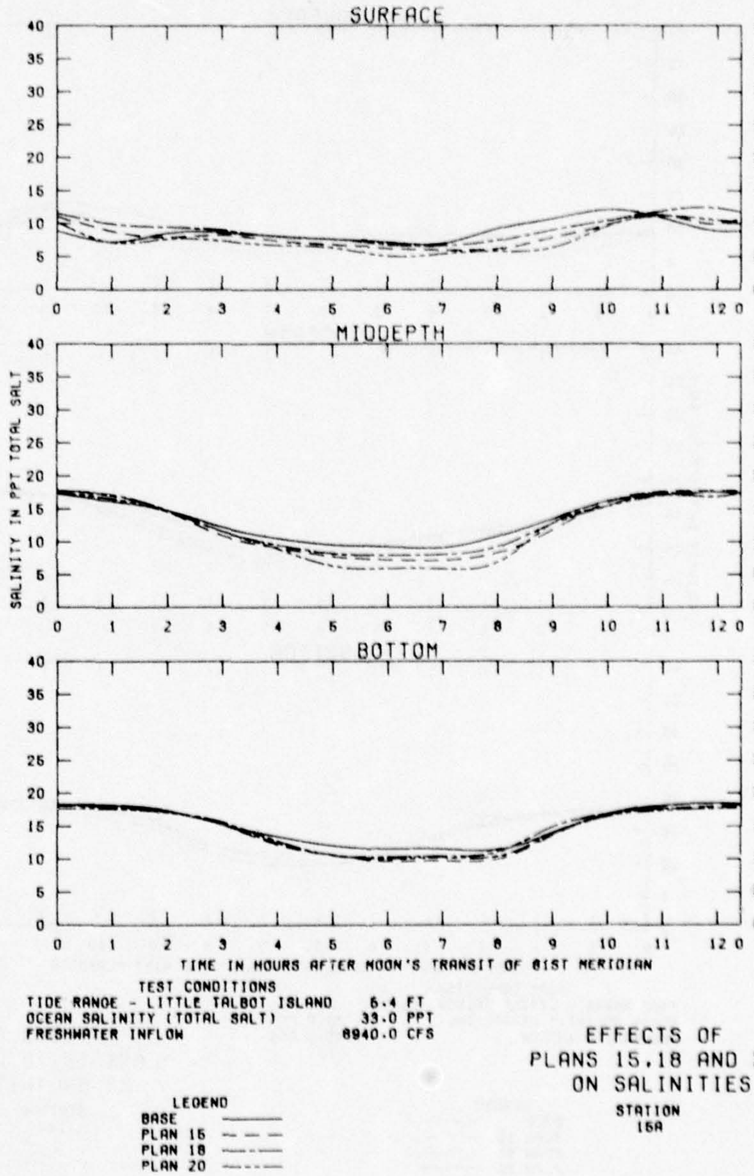
PLATE 37


SURFACE
MIDDEPTH
BOTTOM
SALINITY IN PPT TOTAL SALT
TIME IN HOURS AFTER MOON'S TRANSIT OF 81ST MERIDIAN
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
LEGEND
BASE
PLAN 15
PLAN 18
PLAN 20
EFFECTS OF
PLANS 15, 18 AND 20
ON SALINITIES
STATION
11A



SURFACE
MIDDEPTH
BOTTOM
SALINITY IN PPT TOTAL SALT
TIME IN HOURS AFTER MOON'S TRANSIT OF 81ST MERIDIAN
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
LEGEND
BASE
PLAN 15
PLAN 18
PLAN 20
EFFECTS OF
PLANS 15.18 AND 20
ON SALINITIES
STATION
14A

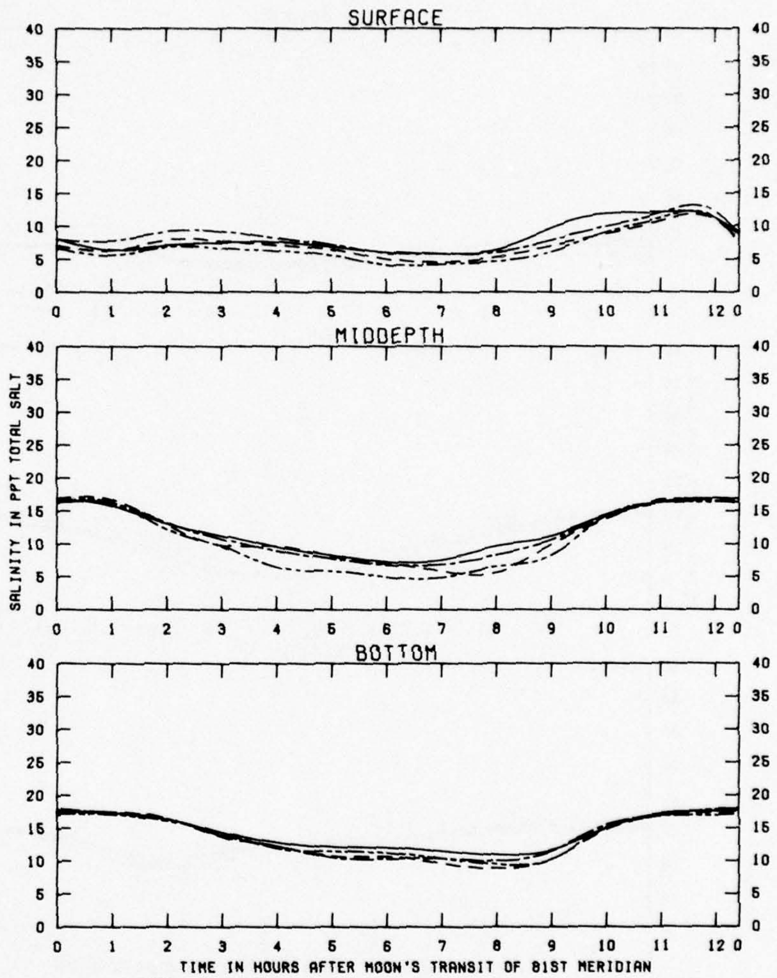
PLATE 39



EFFECTS OF
PLANS 15,18 AND 20
ON SALINITIES

STATION
15A

PLATE 40



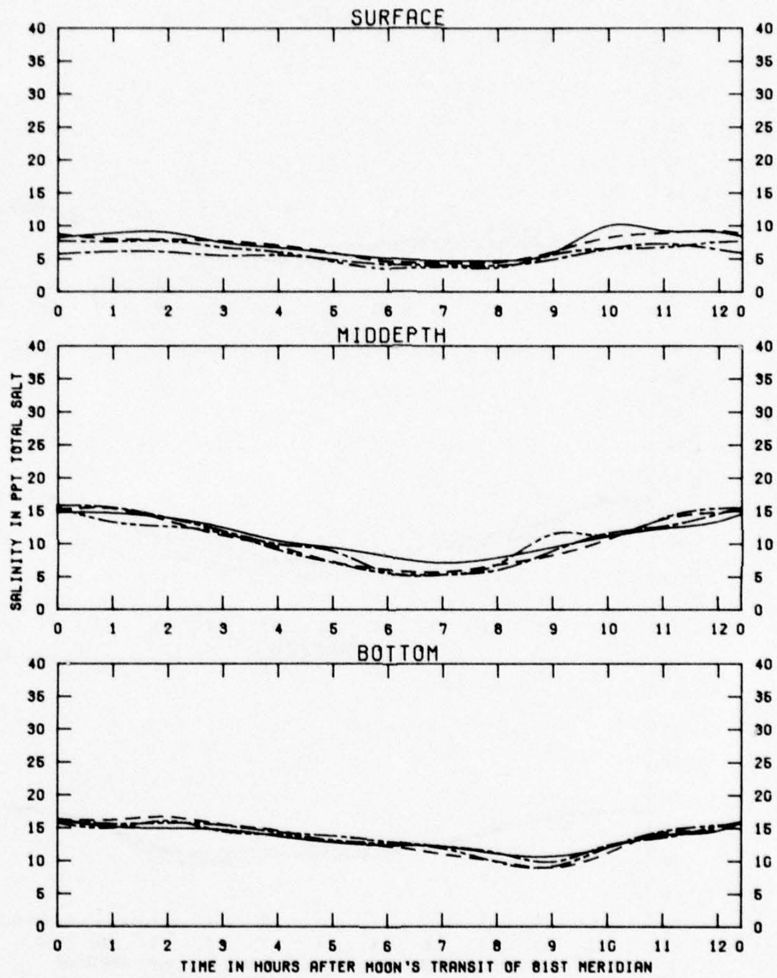
TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS

LEGEND
BASE
PLAN 15
PLAN 18
PLAN 20

EFFECTS OF
PLANS 15,18 AND 20
ON SALINITIES

STATION
16A



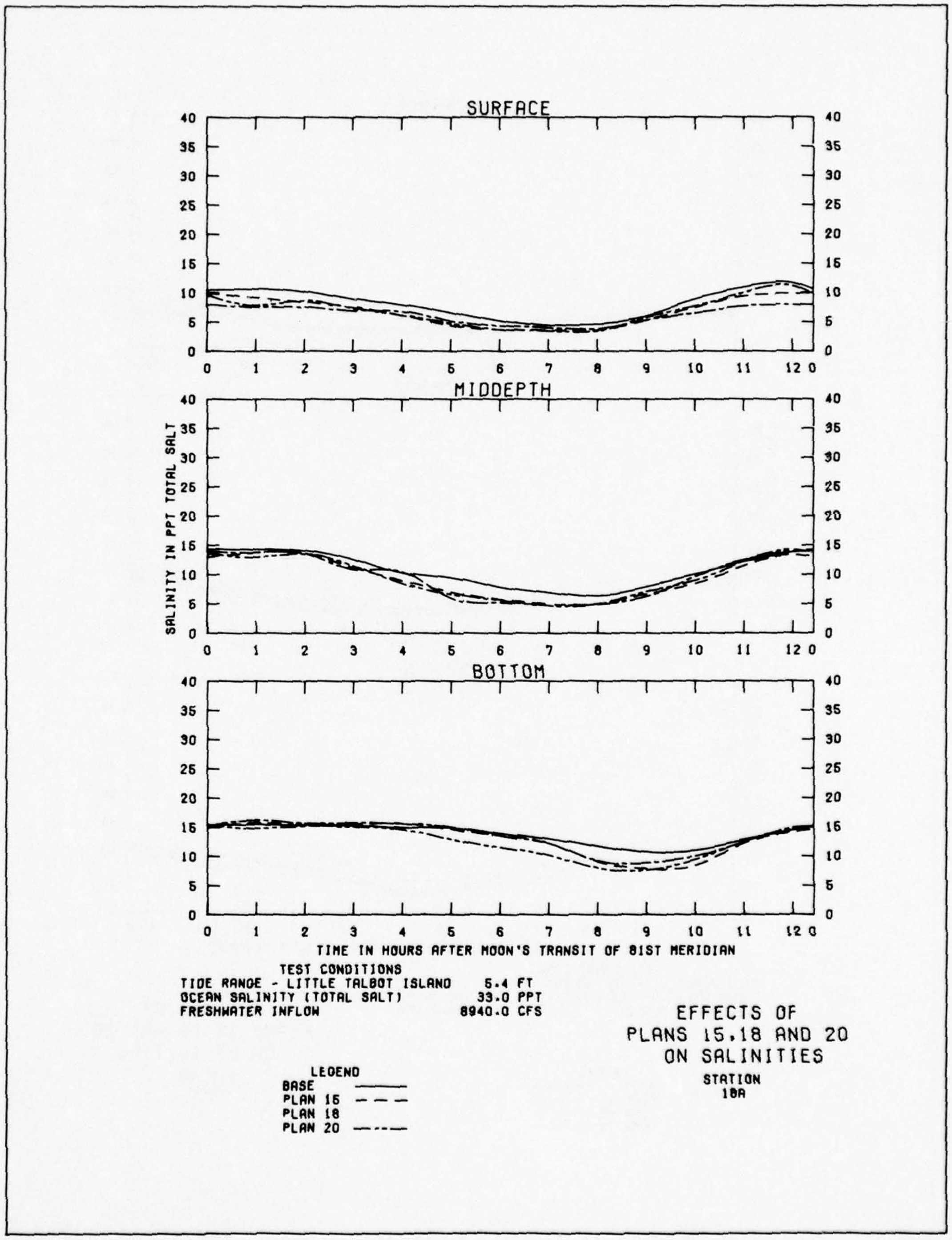
TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS

LEGEND
BASE ———
PLAN 15 — — —
PLAN 18 —·—
PLAN 20 —··—

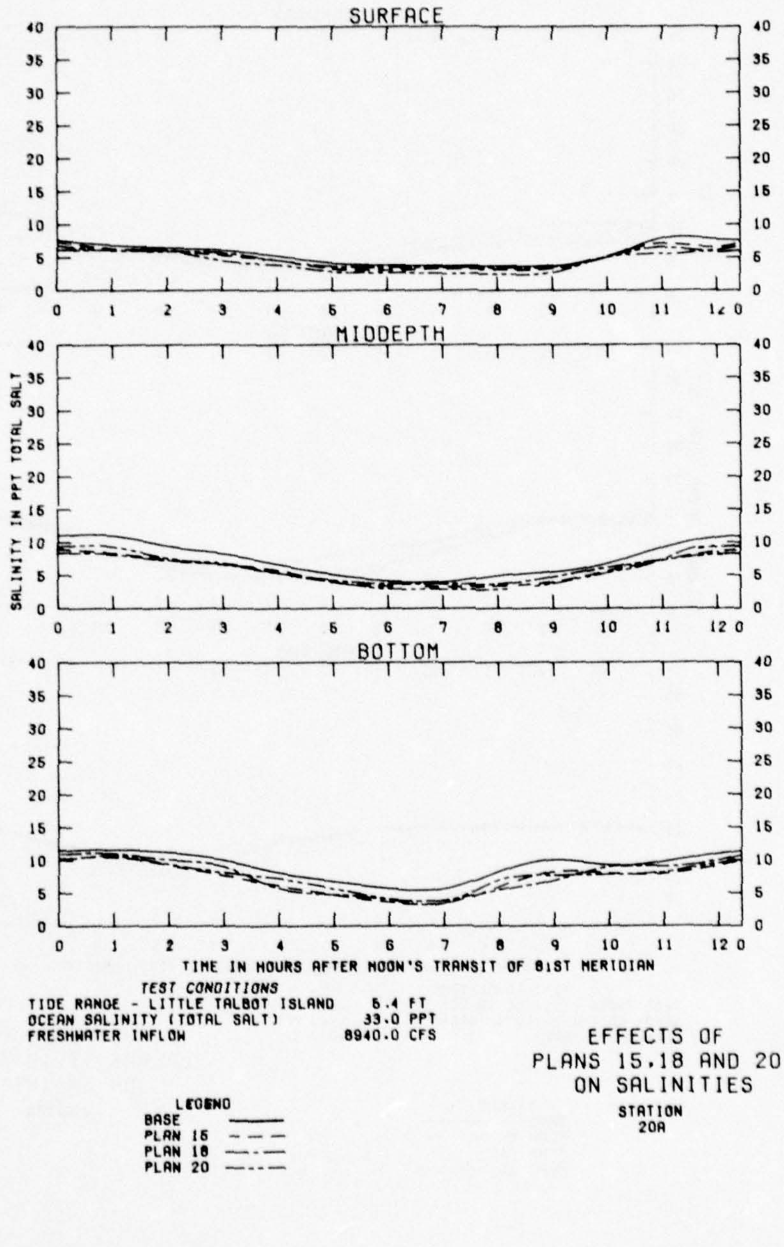
EFFECTS OF
PLANS 15,18 AND 20
ON SALINITIES

STATION
17A

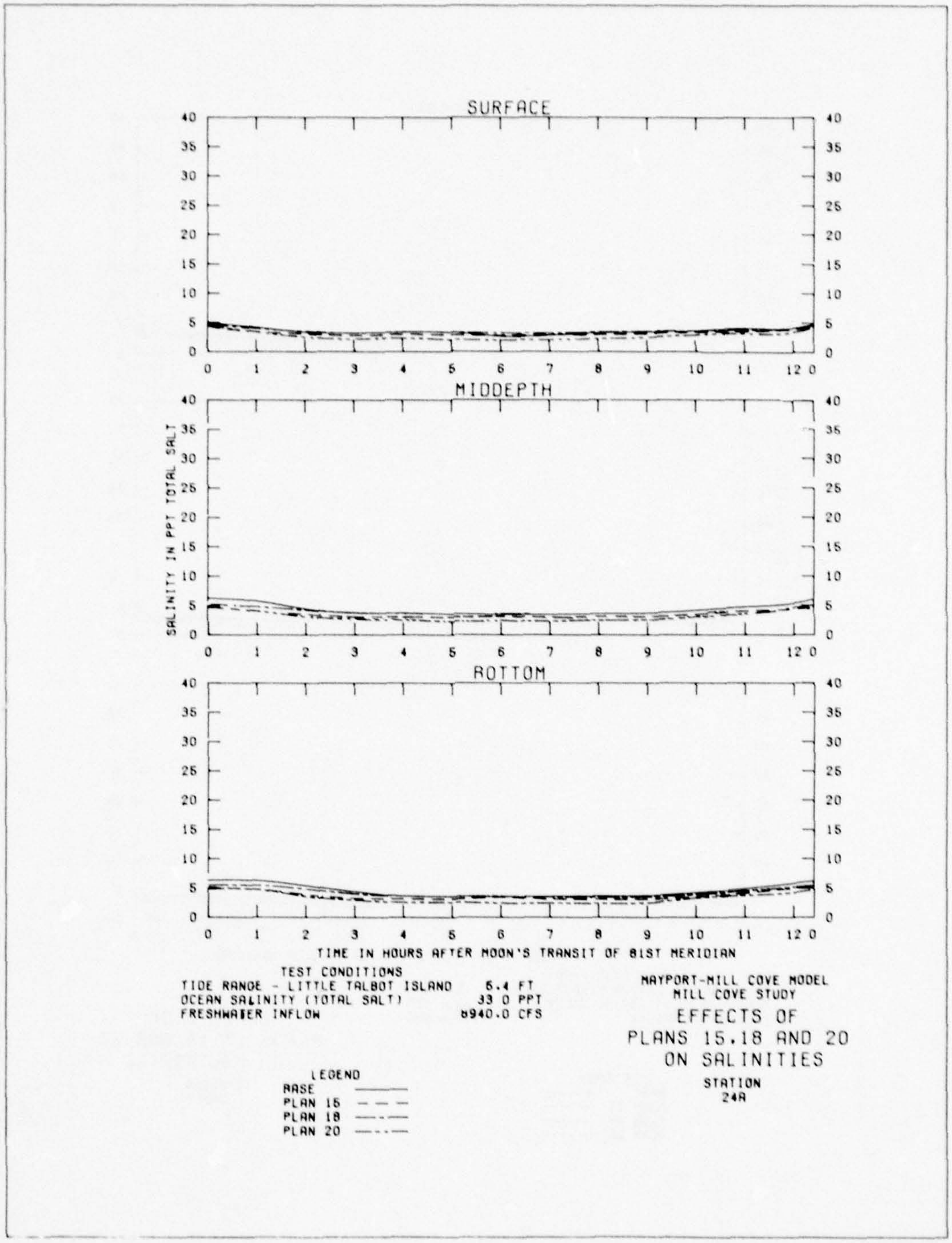


SURFACE
MIDDEPTH
BOTTOM
SALINITY IN PPT TOTAL SALT
TIME IN HOURS AFTER MOON'S TRANSIT OF 81ST MERIDIAN
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
LEGEND
BASE
PLAN 15
PLAN 18
PLAN 20
EFFECTS OF
PLANS 15,18 AND 20
ON SALINITIES
STATION
18A

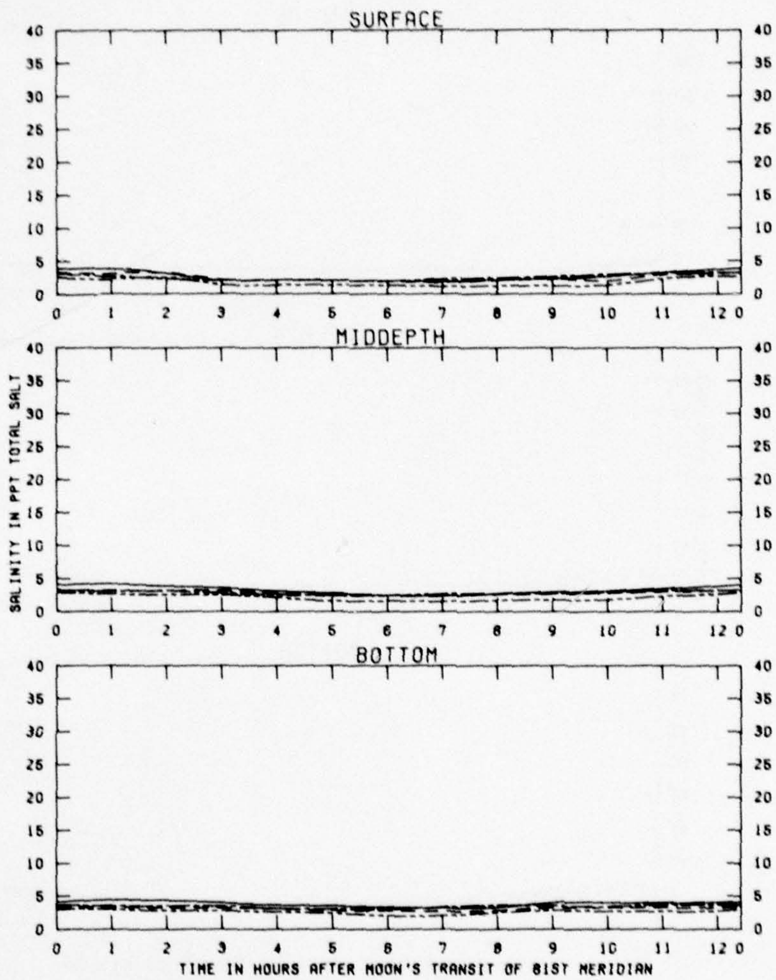
PLATE 43



EFFECTS OF
PLANS 15,18 AND 20
ON SALINITIES
STATION
20A



SURFACE
MIDDEPTH
BOTTOM
SALINITY IN PPT TOTAL SALT
TIME IN HOURS AFTER MOON'S TRANSIT OF 81ST MERIDIAN
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 6940.0 CFS
LEGEND
BASE
PLAN 15
PLAN 18
PLAN 20
MAYPORT-MILL COVE MODEL
MILL COVE STUDY
EFFECTS OF
PLANS 15,18 AND 20
ON SALINITIES
STATION
24A



TEST CONDITIONS

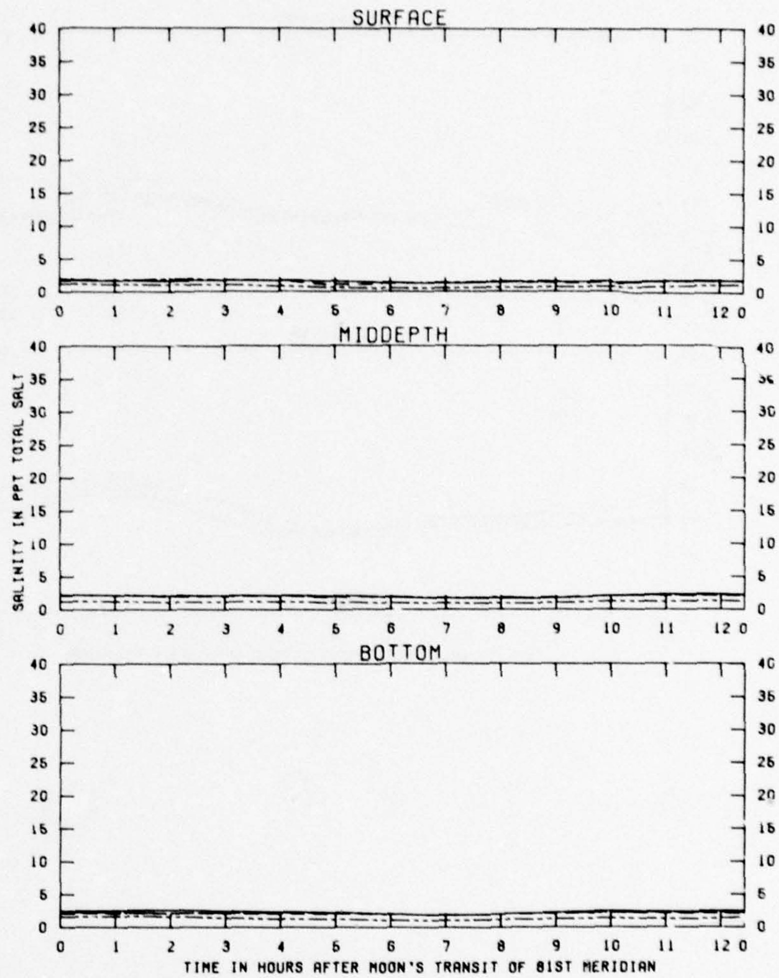
TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS

LEGEND
BASE
PLAN 15
PLAN 18
PLAN 20

EFFECTS OF
PLANS 15.18 AND 20
ON SALINITIES

STATION
28B

PLATE 46



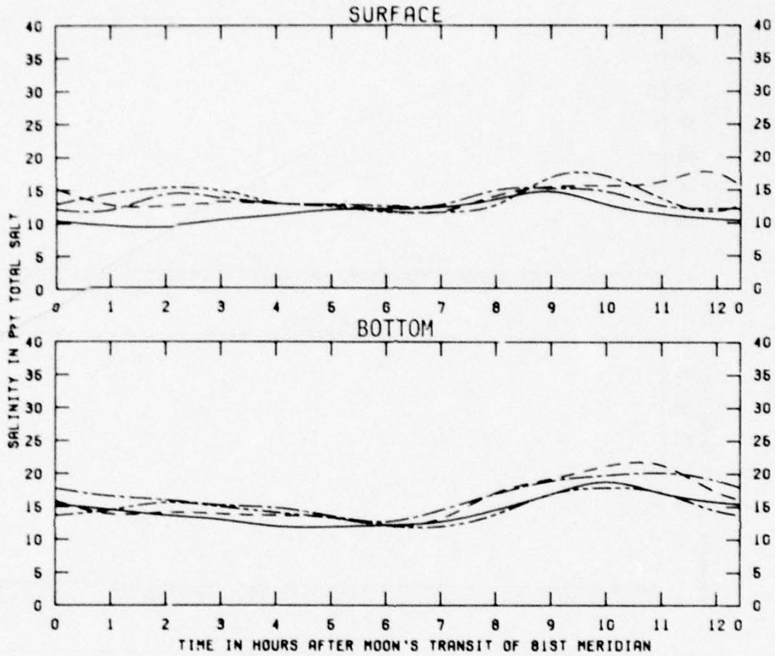
TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS

LEGEND
BASE
PLAN 15
PLAN 18
PLAN 20

EFFECTS OF
PLANS 15, 18 AND 20
ON SALINITIES

STATION
33A



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS

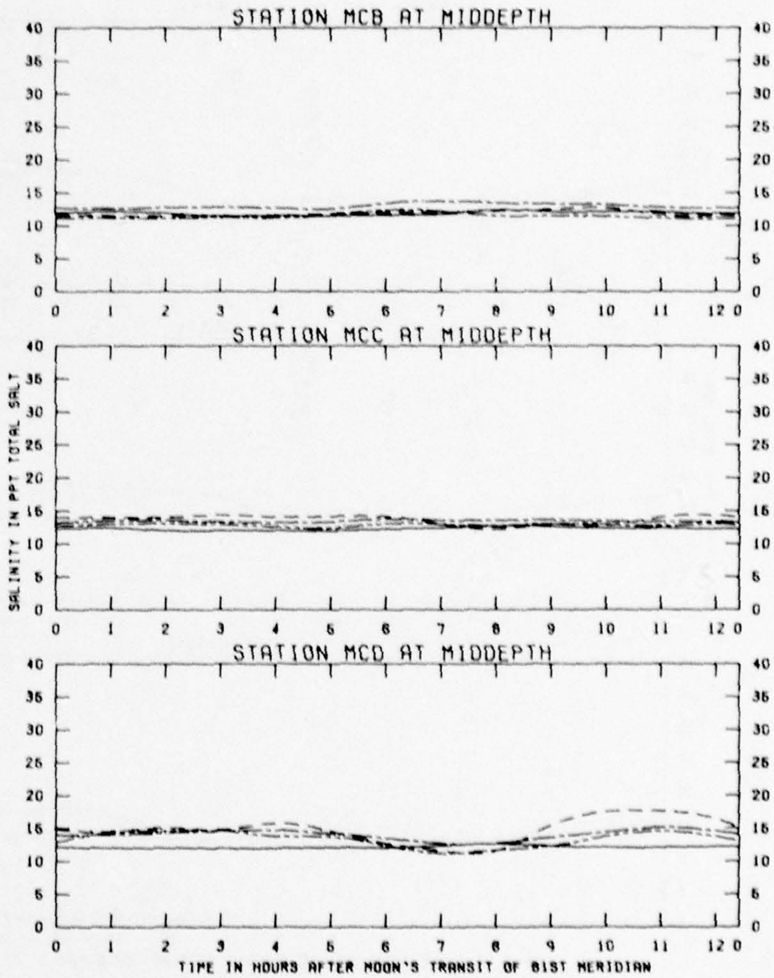
LEGEND

BASE ———
PLAN 15 — — —
PLAN 18 —·—
PLAN 20 —··—

EFFECTS OF
PLANS 15.18 AND 20
ON SALINITIES

STATION
MCA

PLATE 48



TEST CONDITIONS

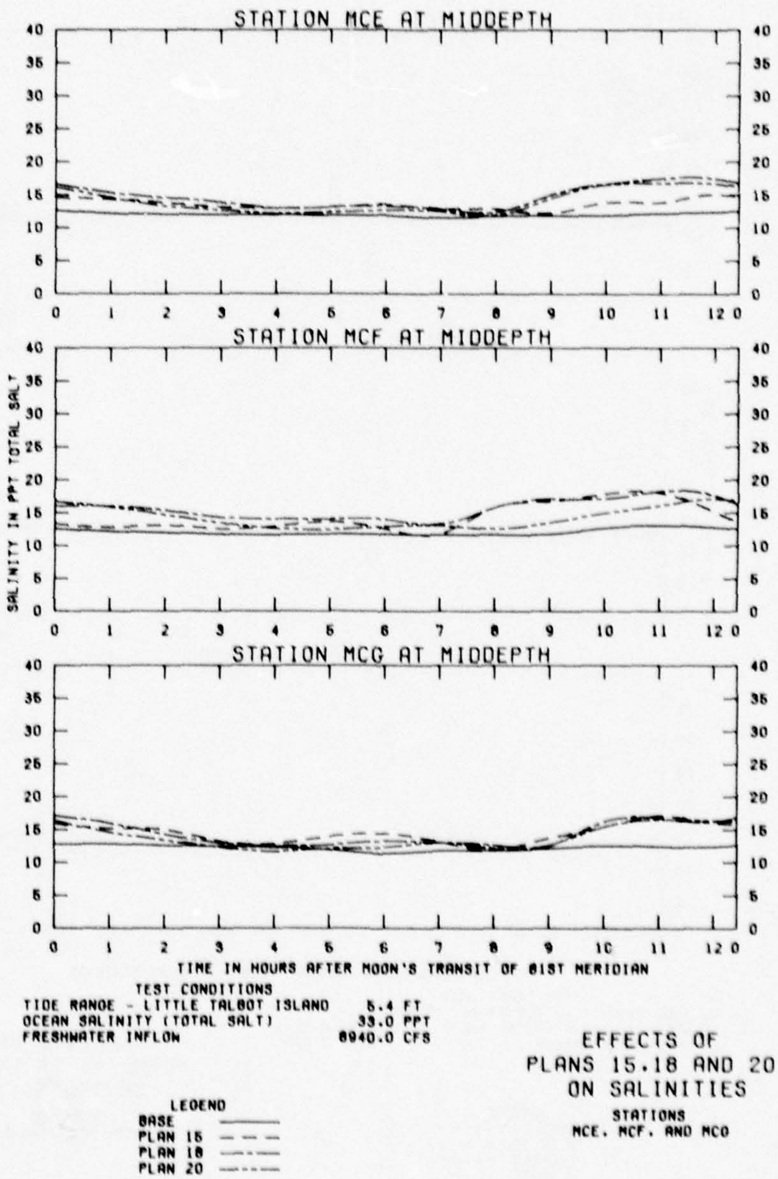
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS

LEGEND

BASE
PLAN 15
PLAN 18
PLAN 20

EFFECTS OF
PLANS 15.18 AND 20
ON SALINITIES

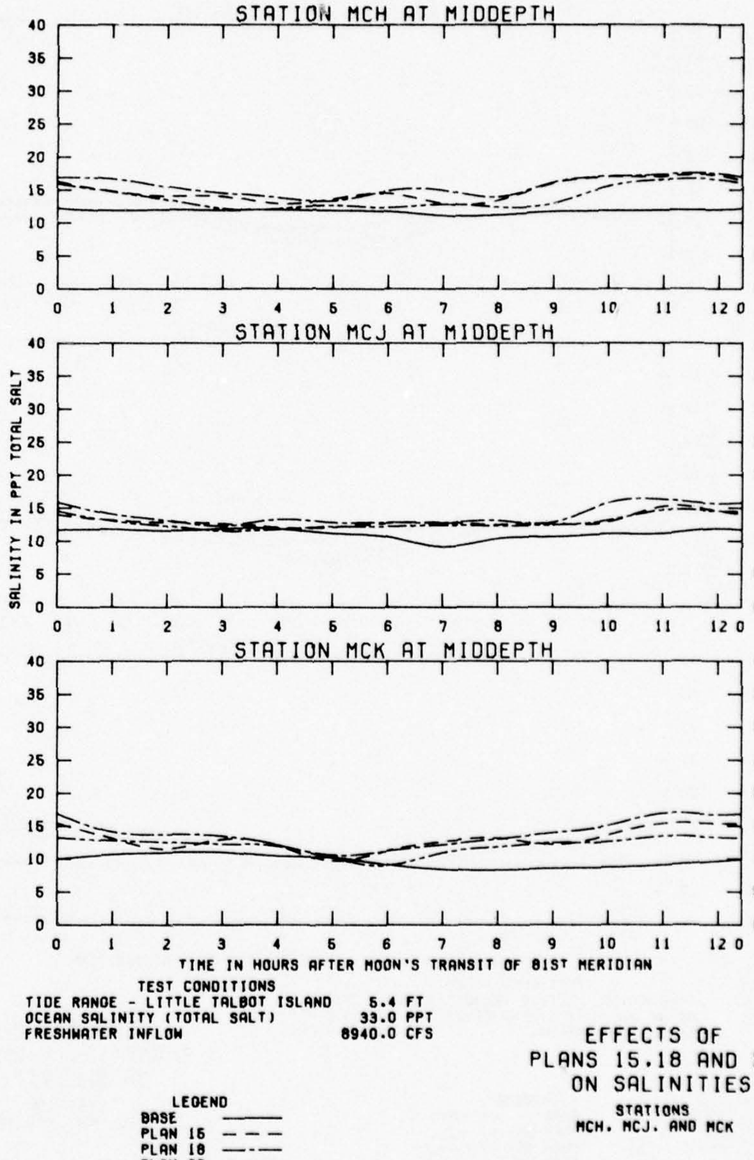
STATIONS
MCB. MCC. AND MCD



EFFECTS OF
PLANS 15.18 AND 20
ON SALINITIES

STATIONS
MCE, MCF, AND MCG

PLATE 50

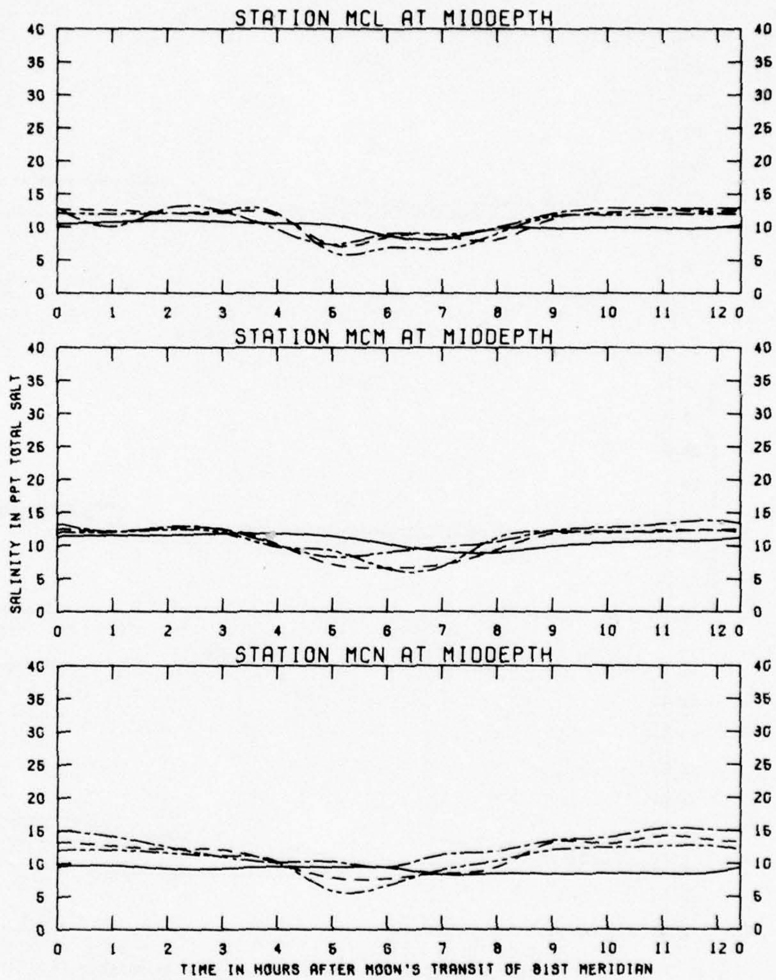


TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS

EFFECTS OF
PLANS 15.18 AND 20
ON SALINITIES
STATIONS
MCH. MCJ. AND MCK

PLATE 51

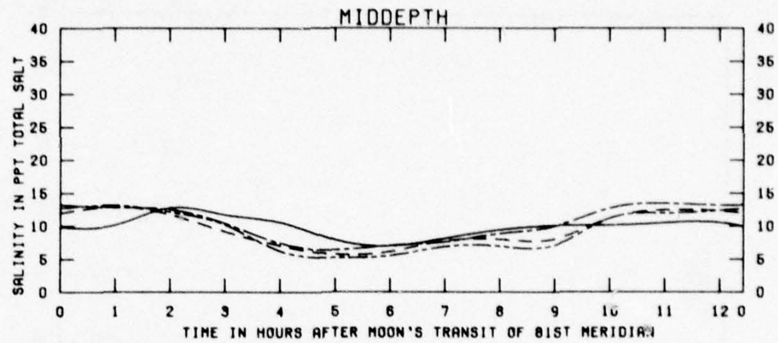


TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS

LEGEND
BASE ————
PLAN 15 — — —
PLAN 18 —·—·—
PLAN 20 —··—··—

EFFECTS OF
PLANS 15.18 AND 20
ON SALINITIES
STATIONS
MCL. MCM. AND MCN

PLATE 52



TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS

LEGEND
BASE ———
PLAN 15 — — —
PLAN 18 —·—
PLAN 20 —··—

EFFECTS OF
PLANS 15.18 AND 20
ON SALINITIES

STATION
MCP

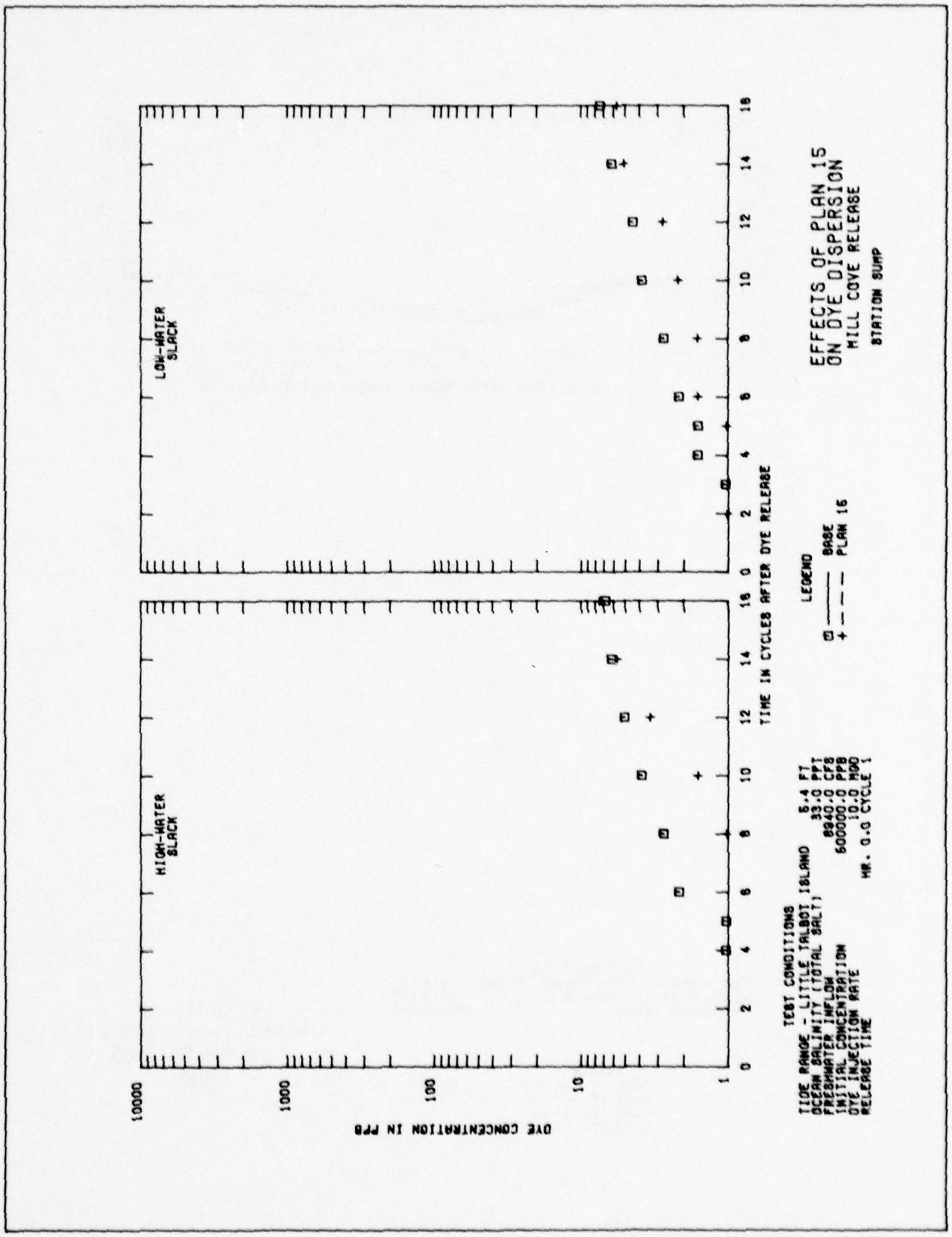

EFFECTS OF PLAN 15
ON DYE DISPERSION
MILL COVE RELEASE
STATION SUMP
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
TIME IN CYCLES AFTER DYE RELEASE
LEGEND
BASE
PLAN 15
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1

PLATE 54

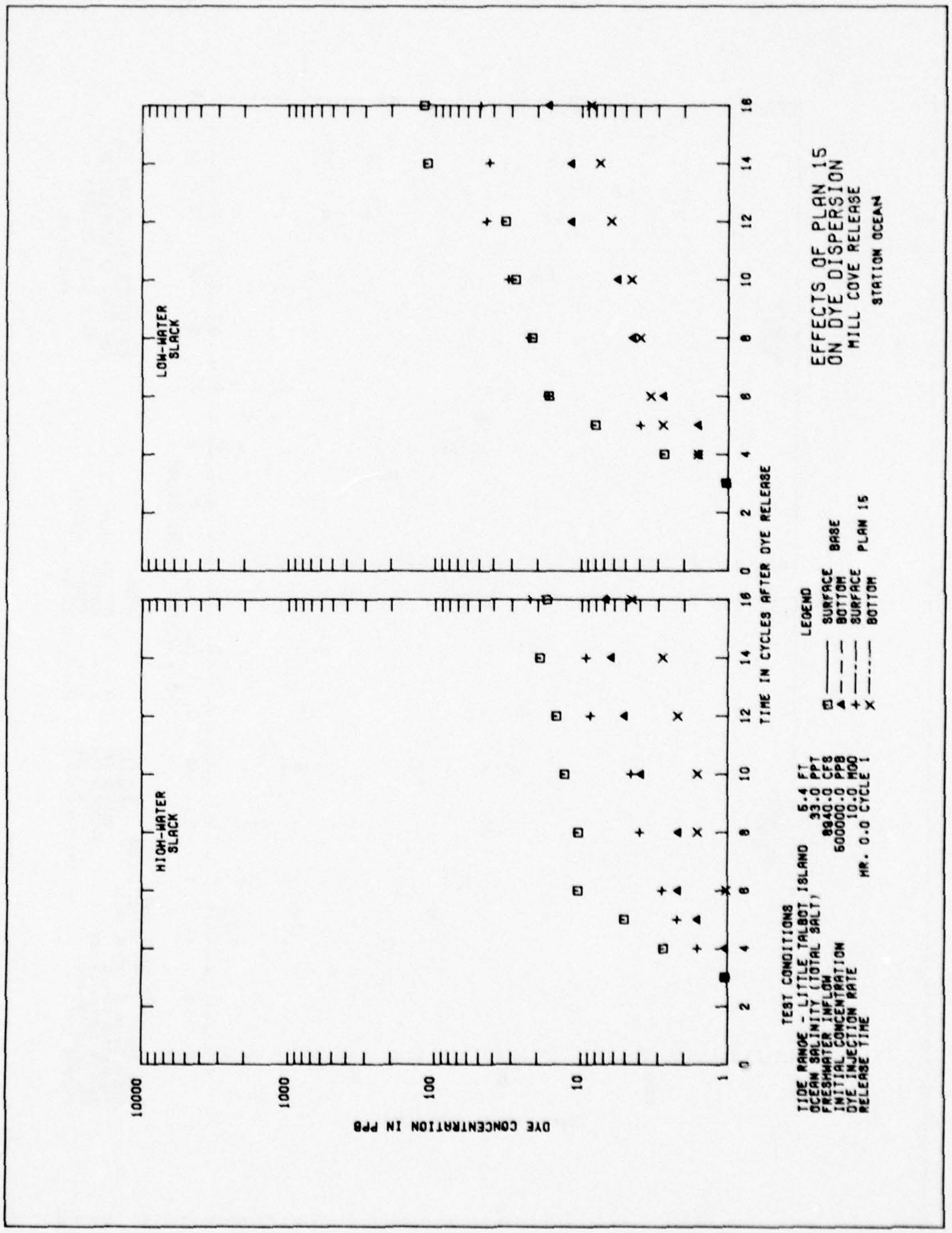

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 10.0 MOO
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 15
EFFECTS OF PLAN 15
ON DYE DISPERSION
MILL COVE RELEASE
STATION OCEAN

PLATE 55

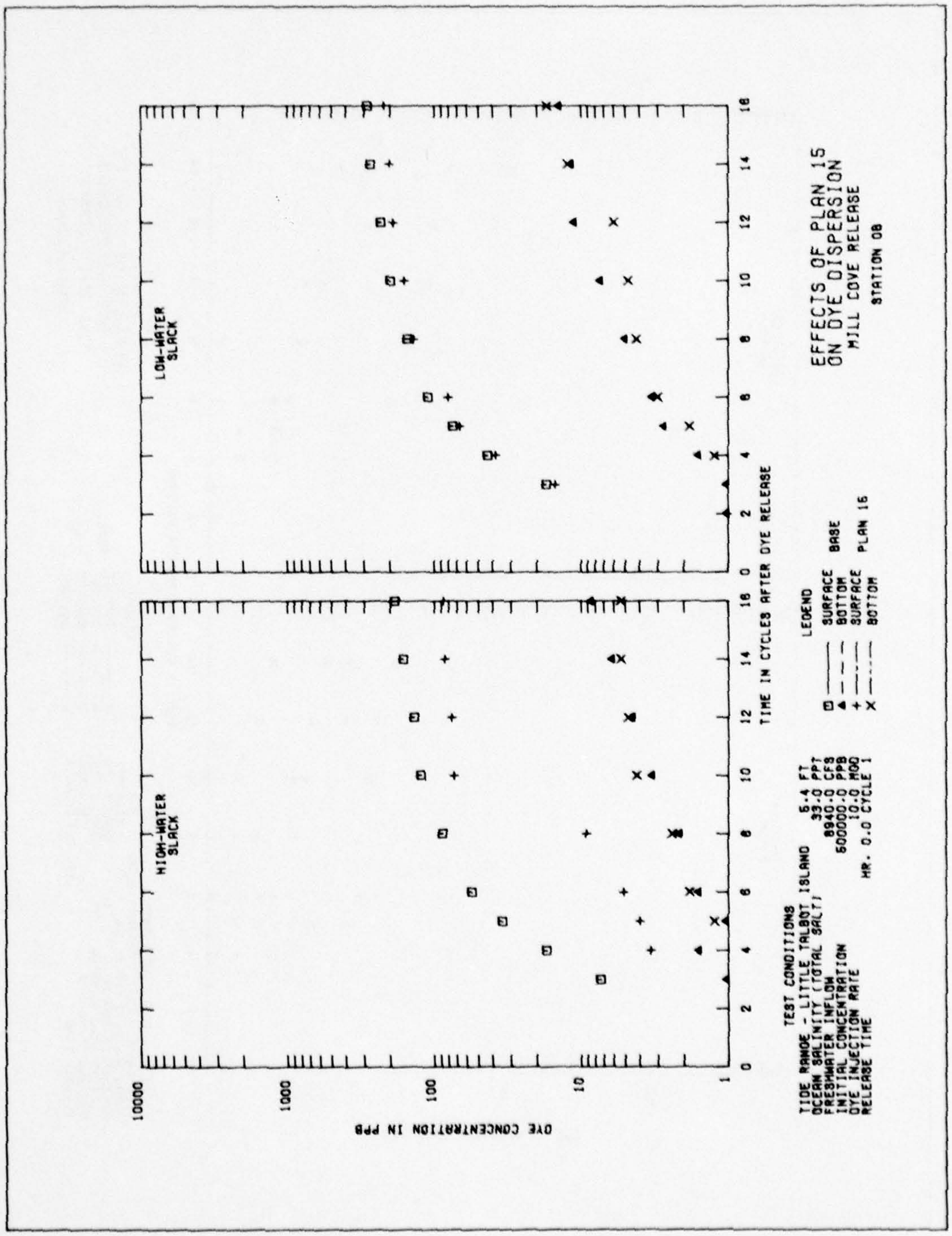

EFFECTS OF PLAN 15
ON DYE DISPERSION
MILL COVE RELEASE
STATION 08
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
TIME IN CYCLES AFTER DYE RELEASE
0
2
4
6
8
10
12
14
16
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 15

PLATE 56

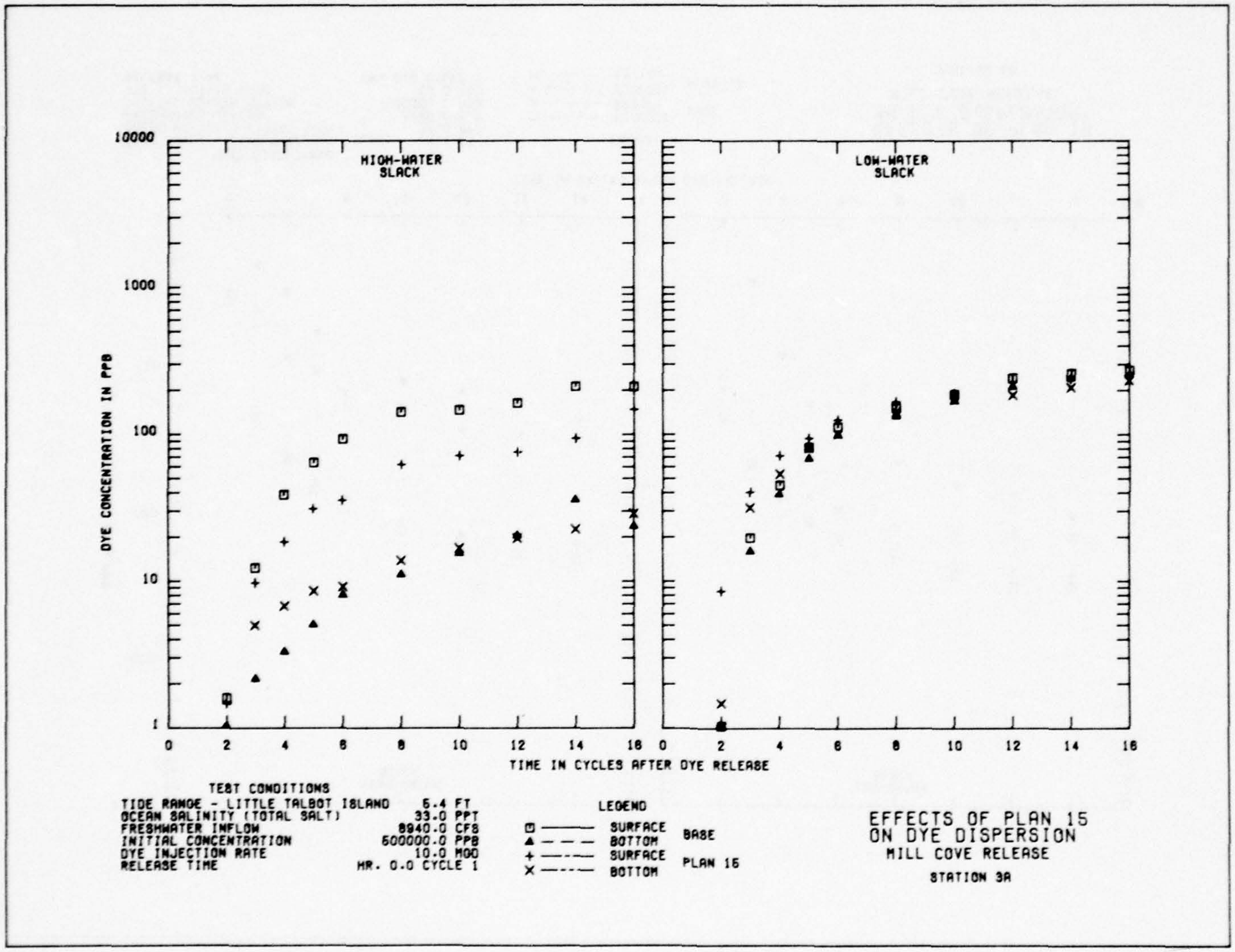
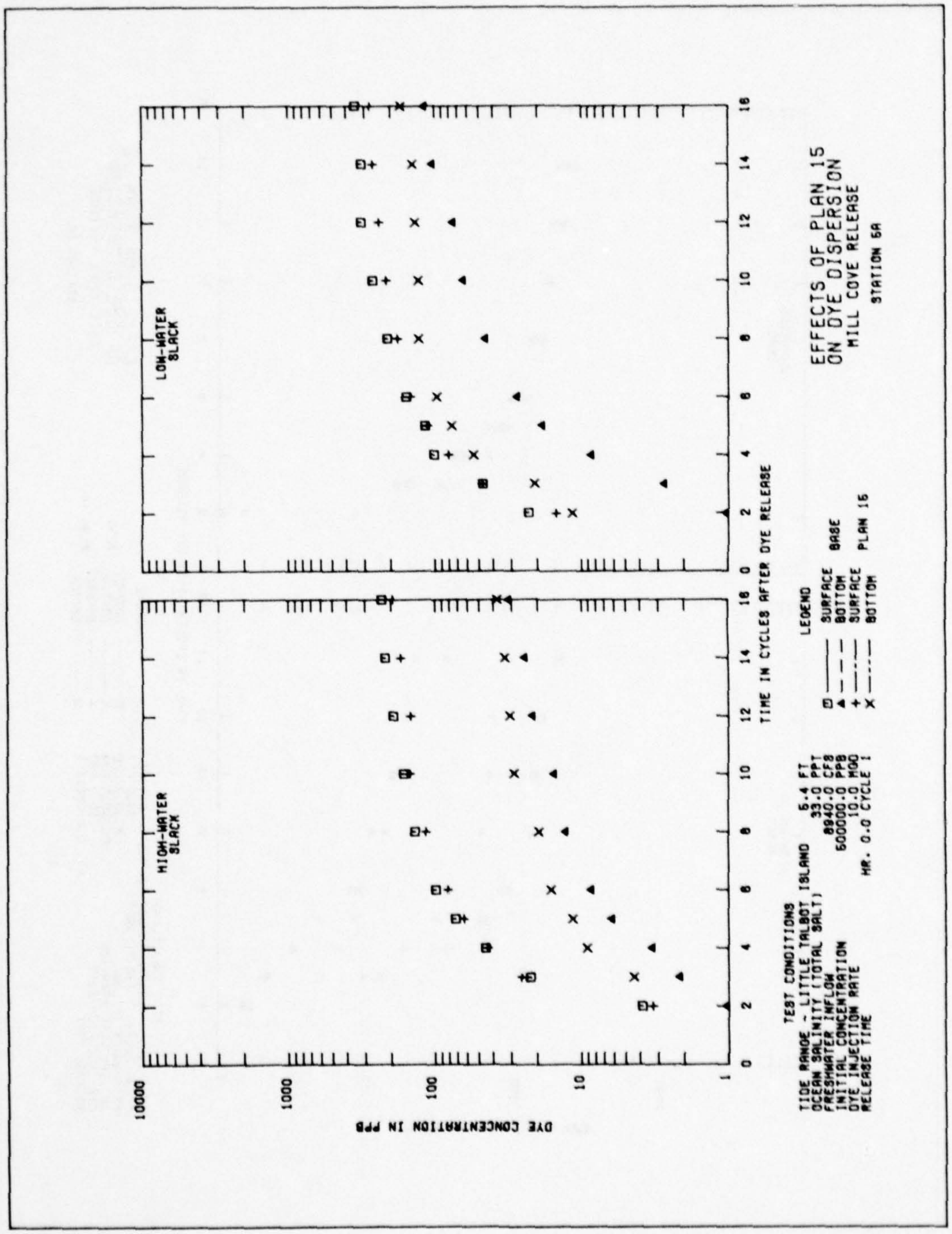
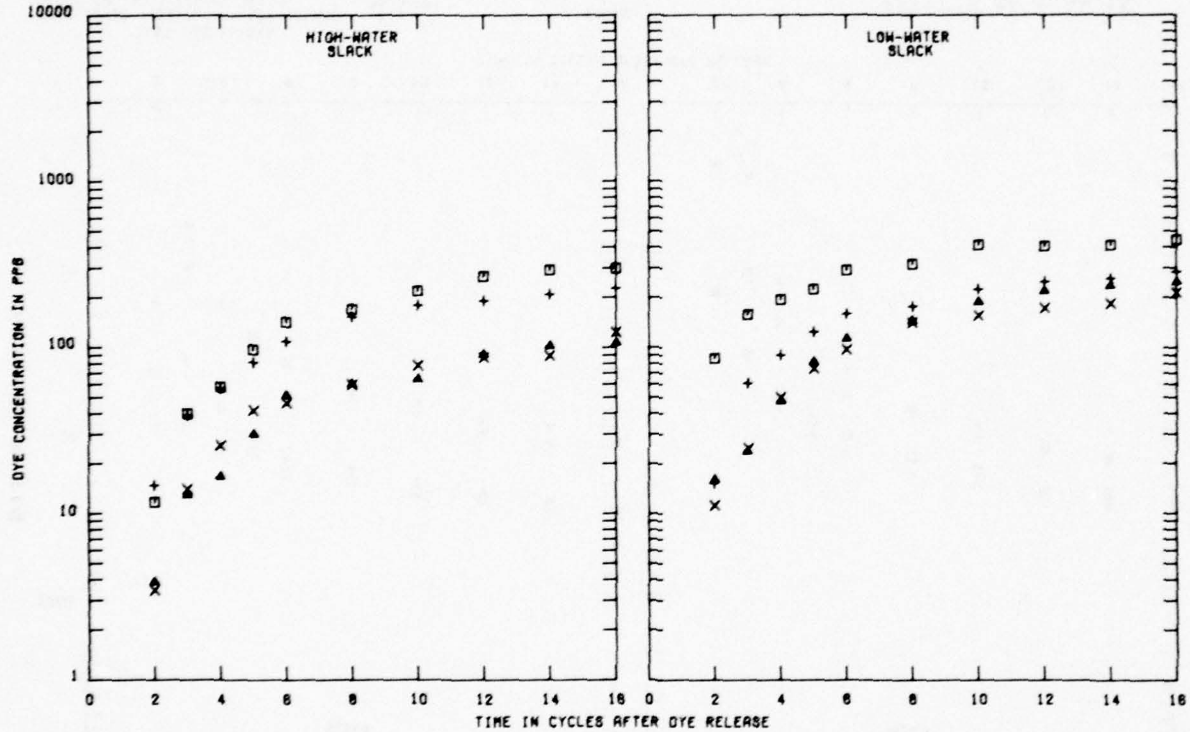

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0 2 4 6 8 10 12 14 16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 15
EFFECTS OF PLAN 15
ON DYE DISPERSION
MILL COVE RELEASE
STATION 3A

PLATE 57



EFFECTS OF PLAN 15
ON DYE DISPERSION
MILL COVE RELEASE
STATION 5A
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 15

PLATE 58



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	6.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	10.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

⊡ ———	SURFACE	BASE
▲ — — —	BOTTOM	
+ —·—·—	SURFACE	PLAN 16
× —··—··	BOTTOM	

EFFECTS OF PLAN 15
ON DYE DISPERSION
MILL COVE RELEASE

STATION 7B

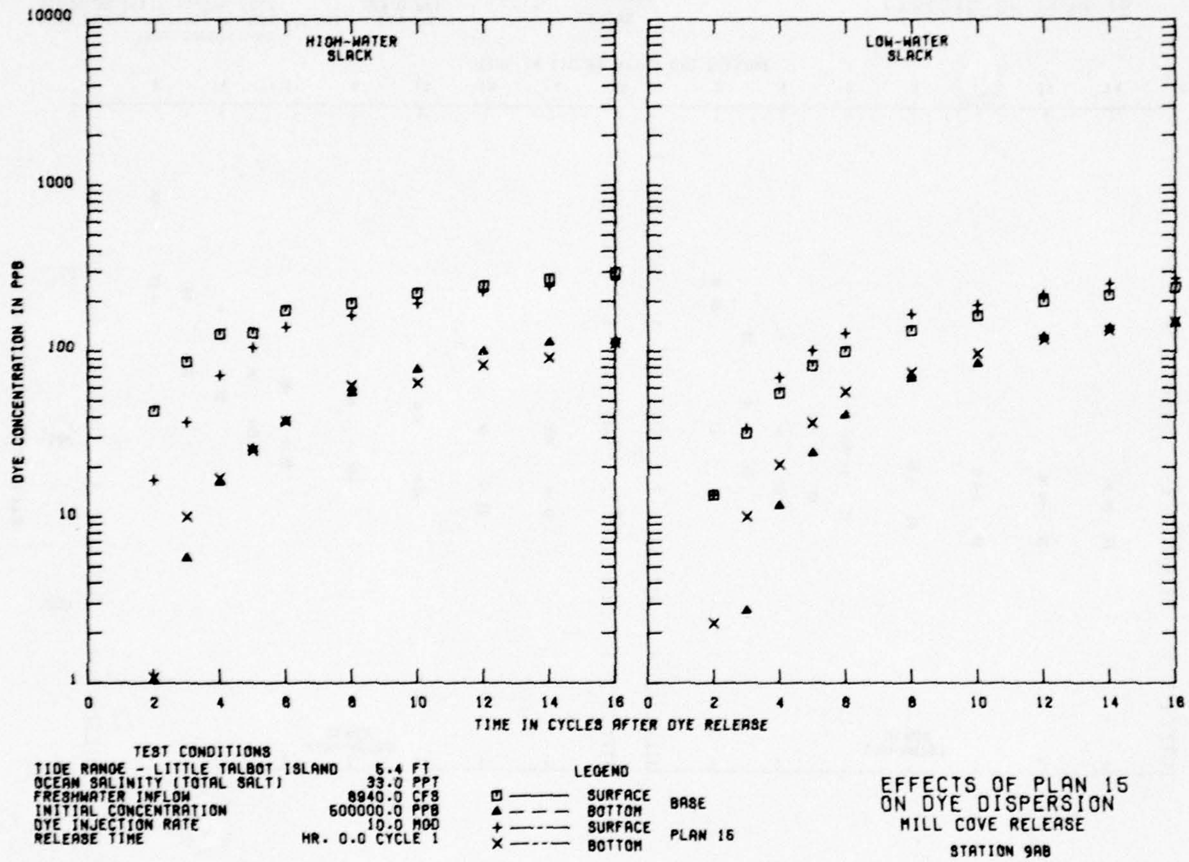
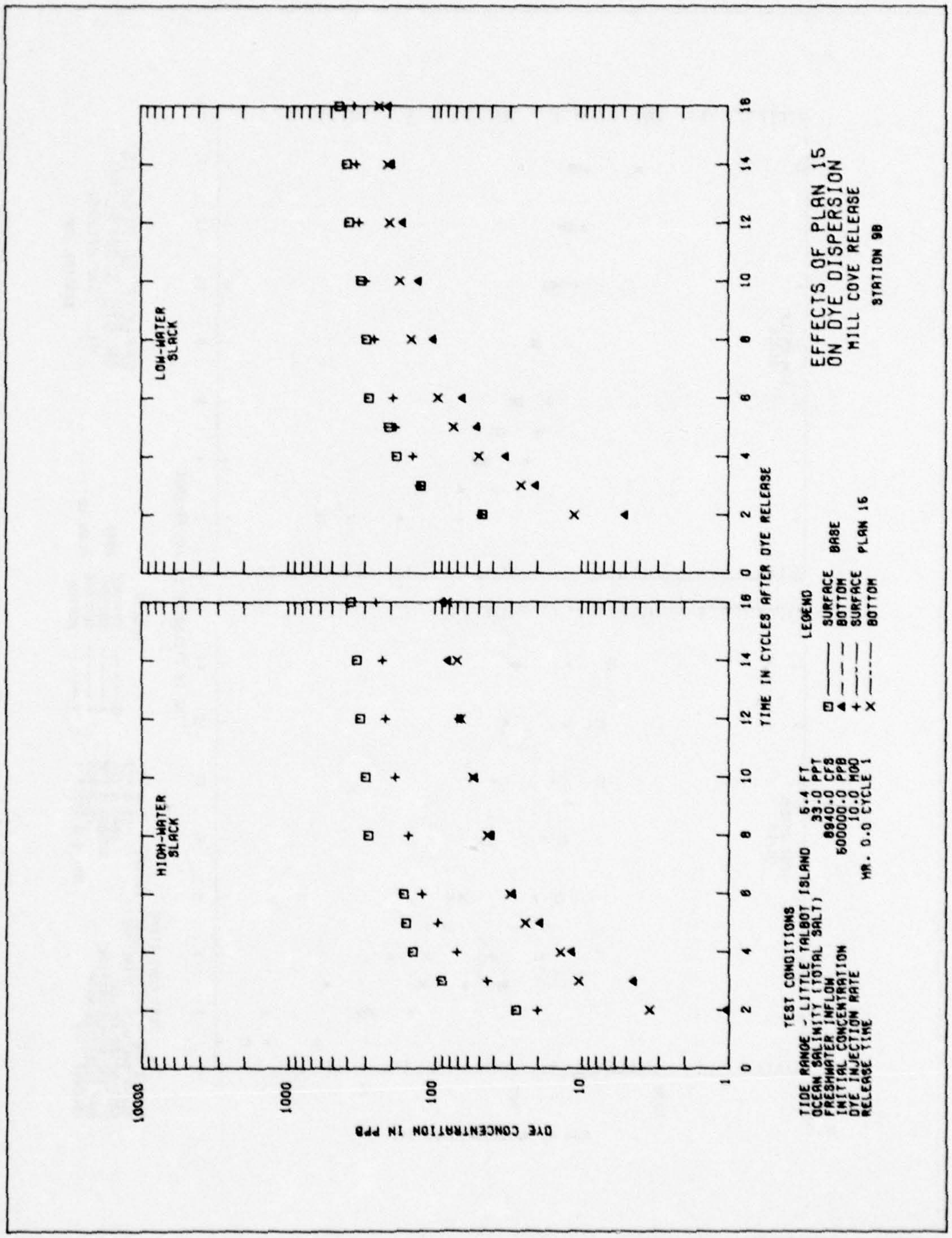
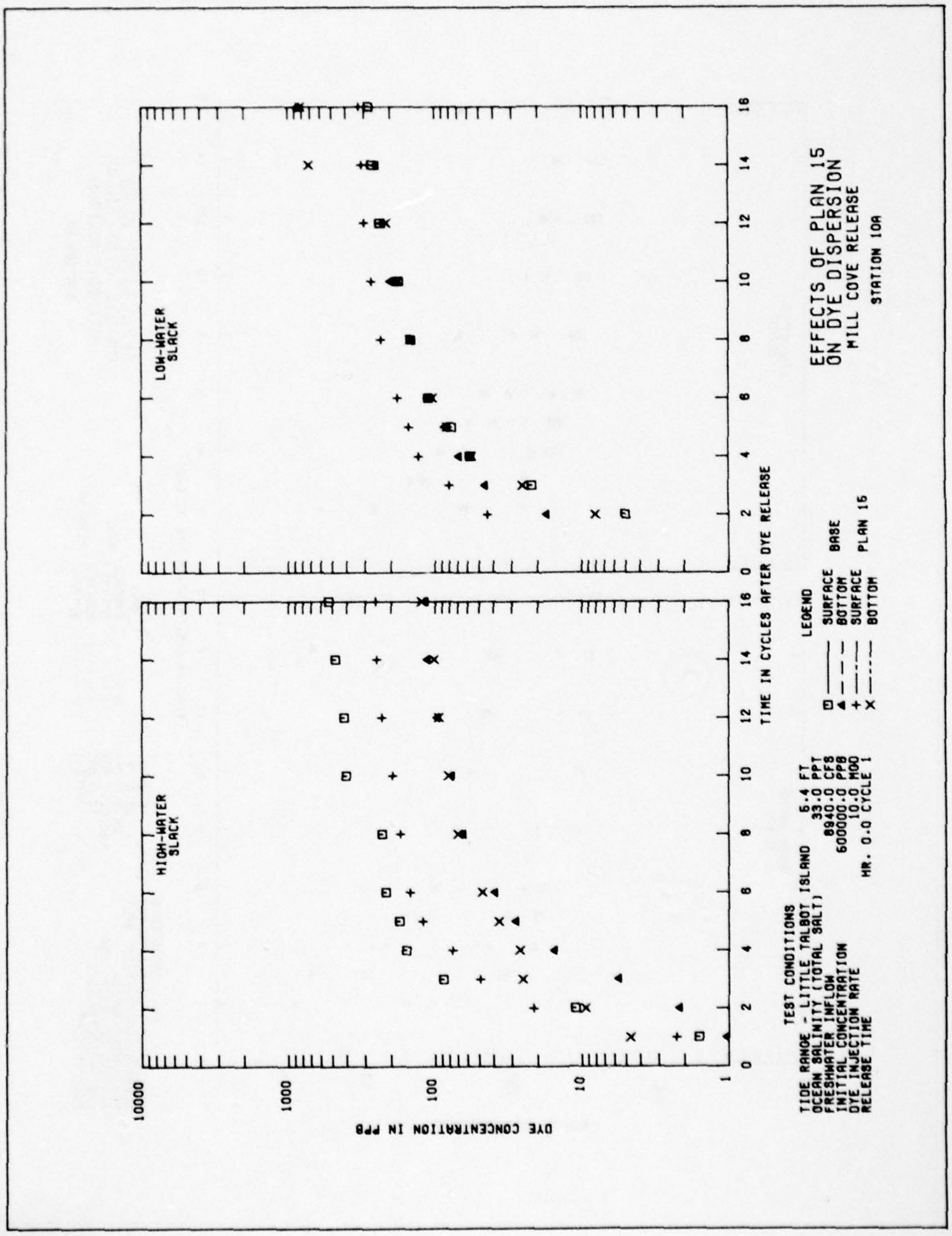

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 15
EFFECTS OF PLAN 15
ON DYE DISPERSION
MILL COVE RELEASE
STATION 9AB

PLATE 60


EFFECTS OF PLAN 15
ON DYE DISPERSION
MILL COVE RELEASE
STATION 9B
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
18
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE BASE
BOTTOM
SURFACE PLAN 15
BOTTOM



HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 15
EFFECTS OF PLAN 15 ON DYE DISPERSION
MILL COVE RELEASE
STATION 10A

PLATE 62

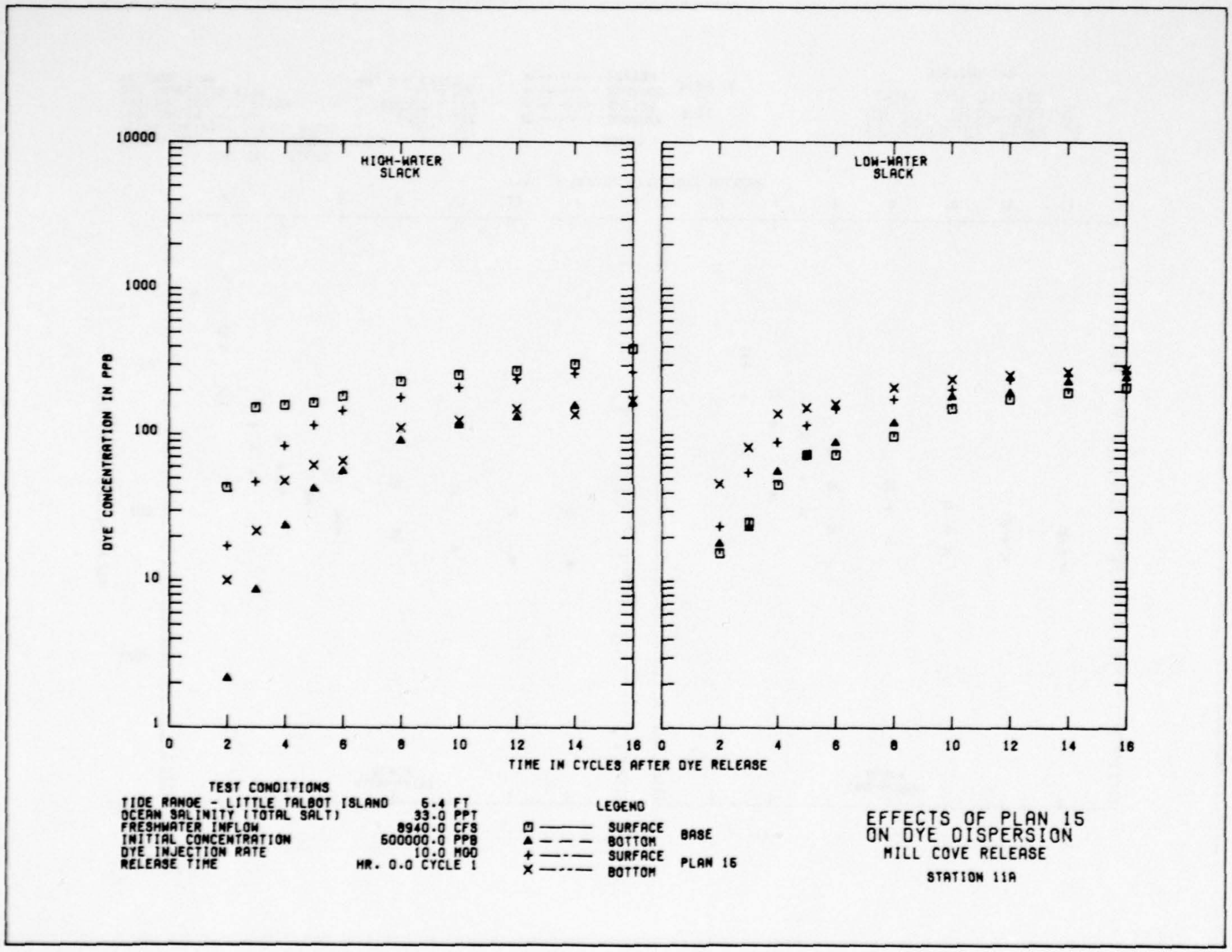

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 15
EFFECTS OF PLAN 15
ON DYE DISPERSION
MILL COVE RELEASE
STATION 11A

PLATE 63

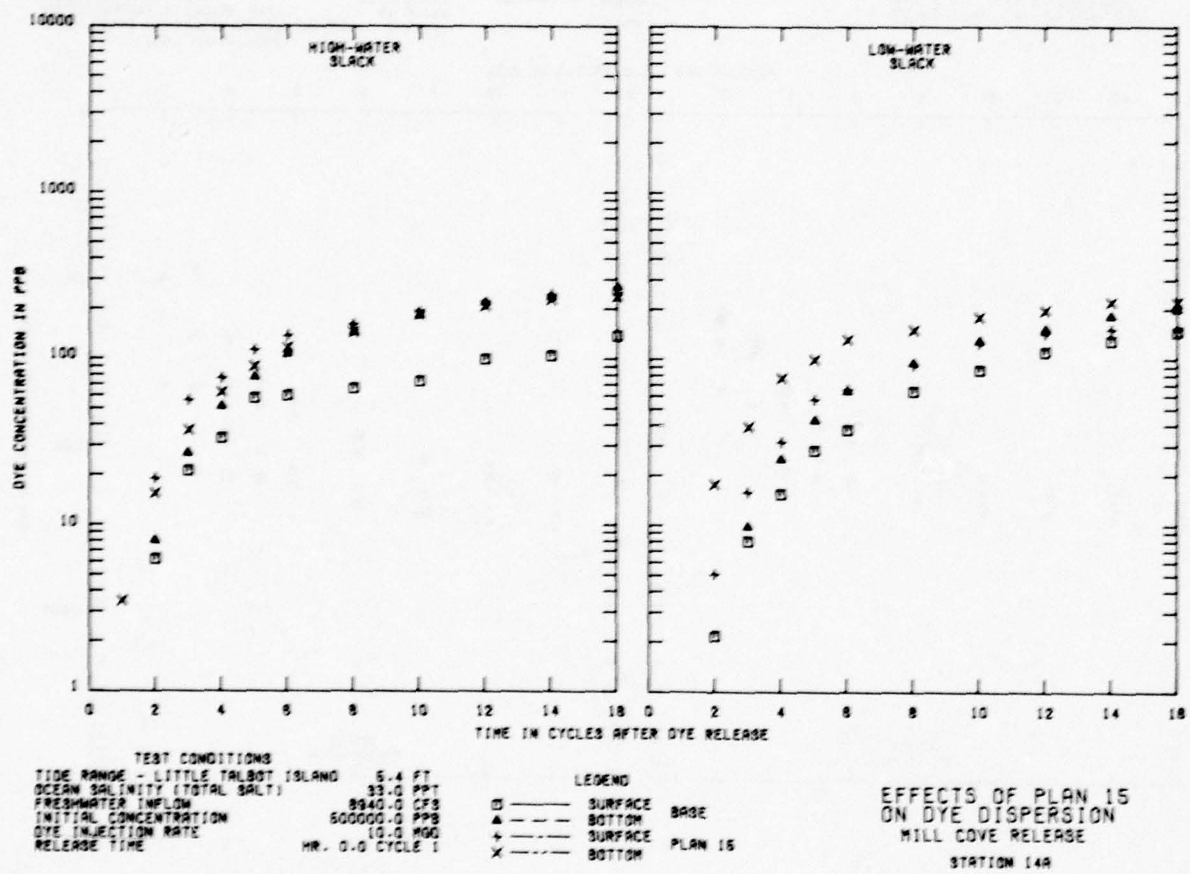
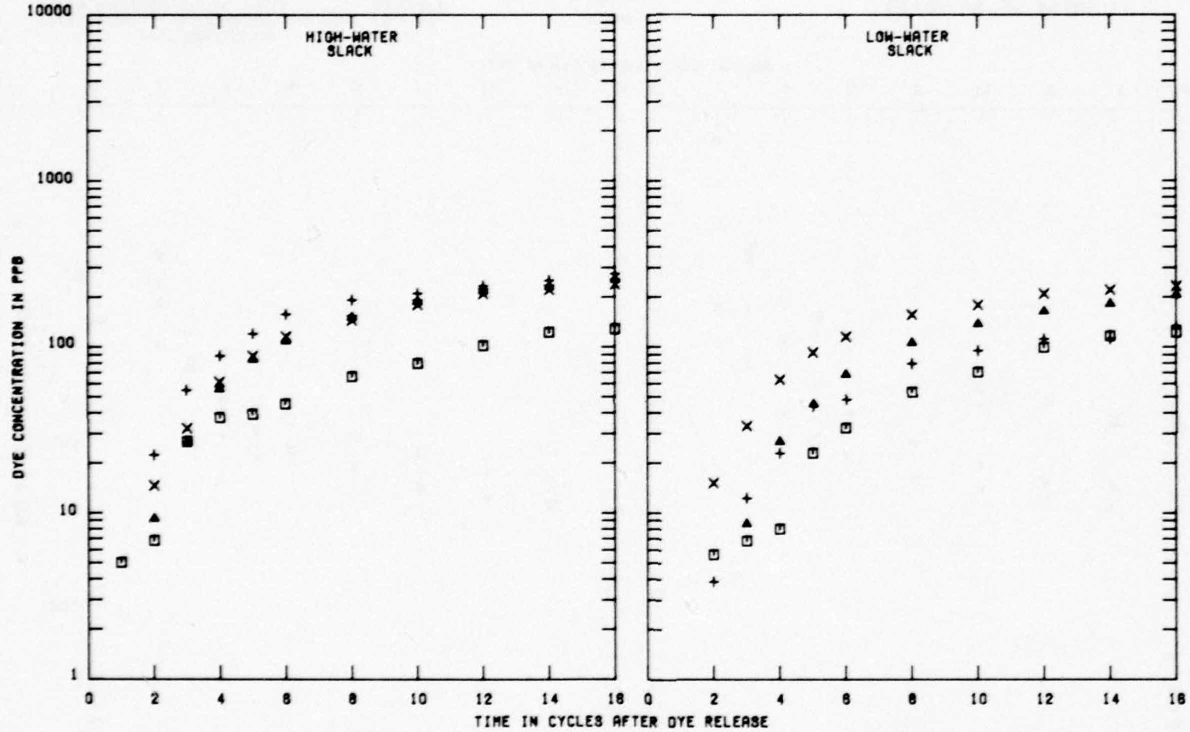

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
18
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 15
EFFECTS OF PLAN 15
ON DYE DISPERSION
MILL COVE RELEASE
STATION 14A

PLATE 64



TEST CONDITIONS

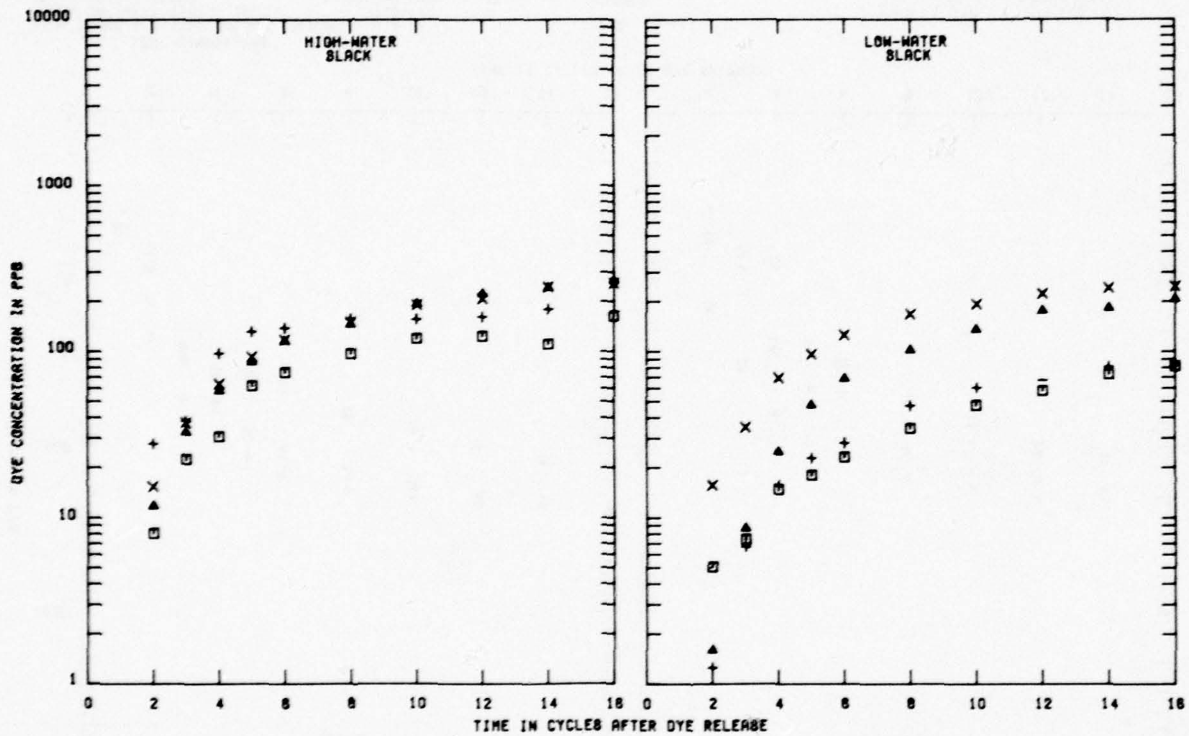
TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	10.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

⊡ ——— SURFACE BASE
▲ — — — BOTTOM BASE
+ —·—·— SURFACE PLAN 15
× —··—·· BOTTOM PLAN 15

EFFECTS OF PLAN 15
ON DYE DISPERSION
MILL COVE RELEASE

STATION 15A



TEST CONDITIONS

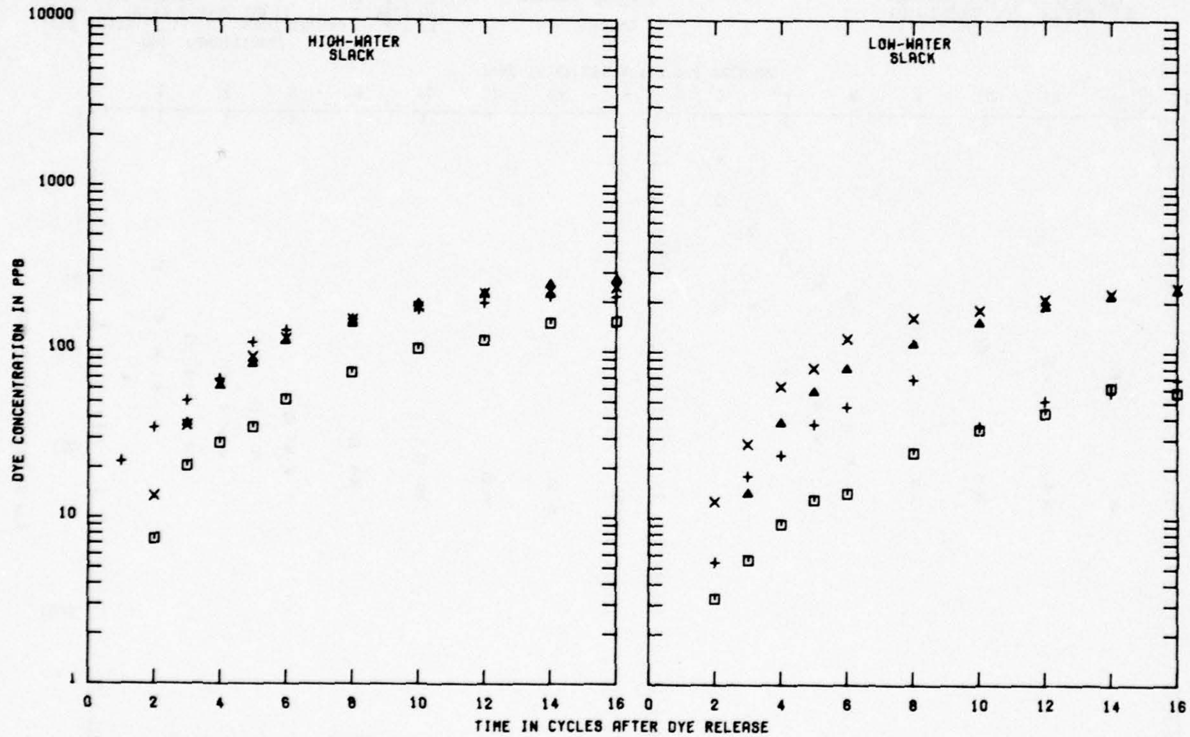
TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	10.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

- ⊡ ——— SURFACE — BASE
- ▲ — — — BOTTOM — BASE
- + —-—-— SURFACE — PLAN 15
- × —-—-— BOTTOM — PLAN 15

EFFECTS OF PLAN 15
ON DYE DISPERSION
MILL COVE RELEASE

STATION 16A



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	10.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

⊡ ———	SURFACE	BASE
▲ — — —	BOTTOM	
+ —·—·—	SURFACE	PLAN 15
× —··—··—	BOTTOM	

EFFECTS OF PLAN 15
ON DYE DISPERSION
MILL COVE RELEASE

STATION 17A

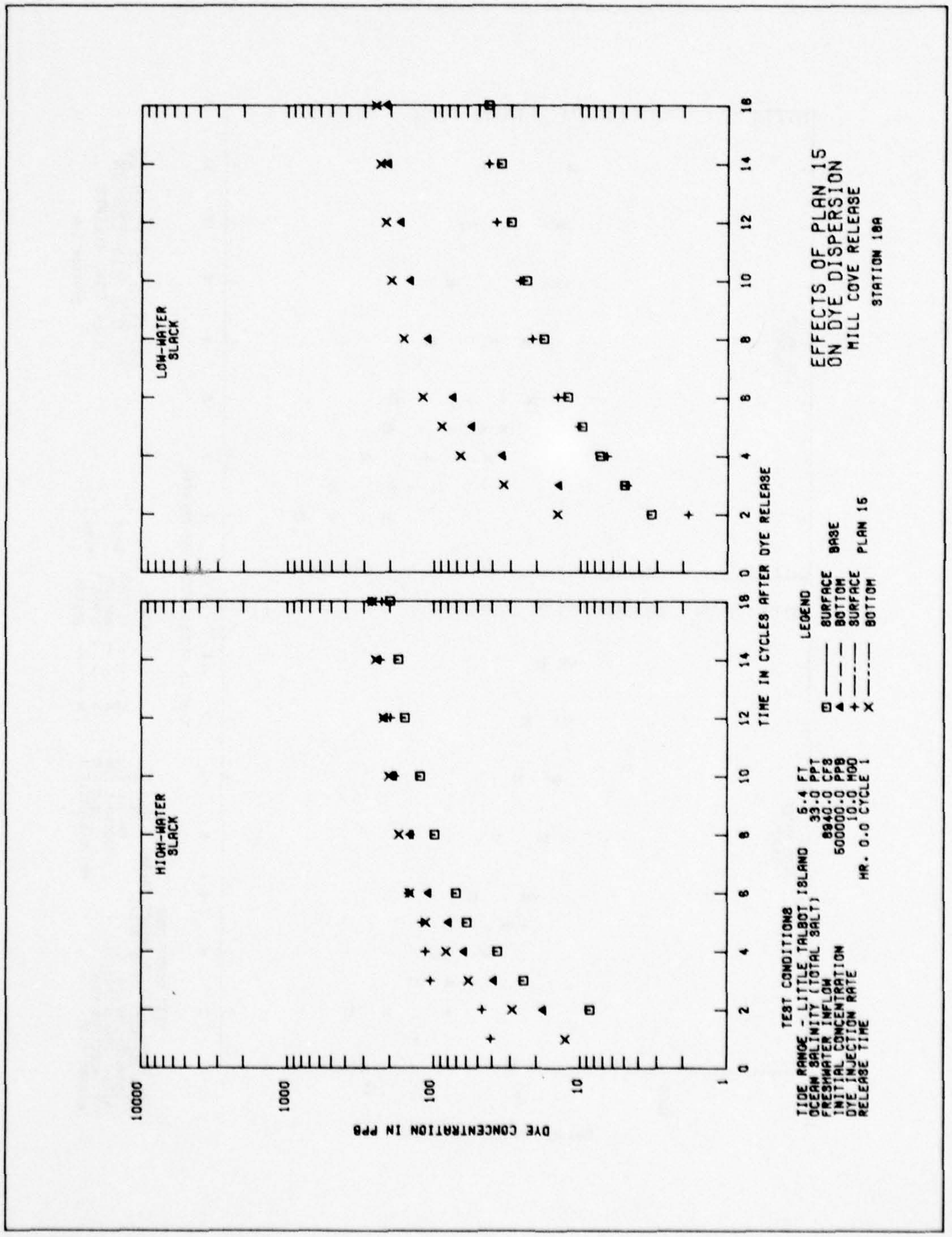

EFFECTS OF PLAN 15
ON DYE DISPERSION
MILL COVE RELEASE
STATION 18A
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 15

PLATE 68

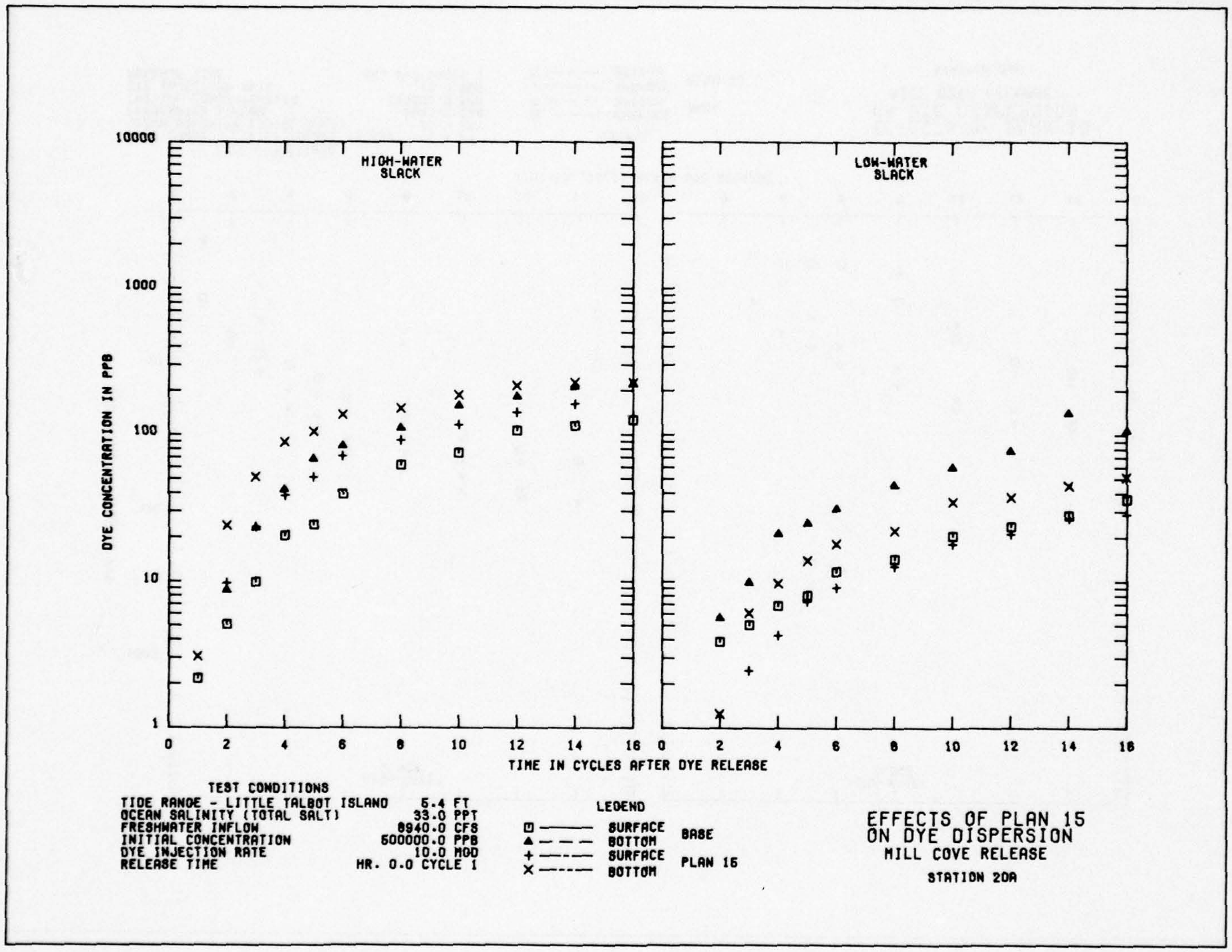

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MOD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 15
EFFECTS OF PLAN 15
ON DYE DISPERSION
MILL COVE RELEASE
STATION 20A

PLATE 69

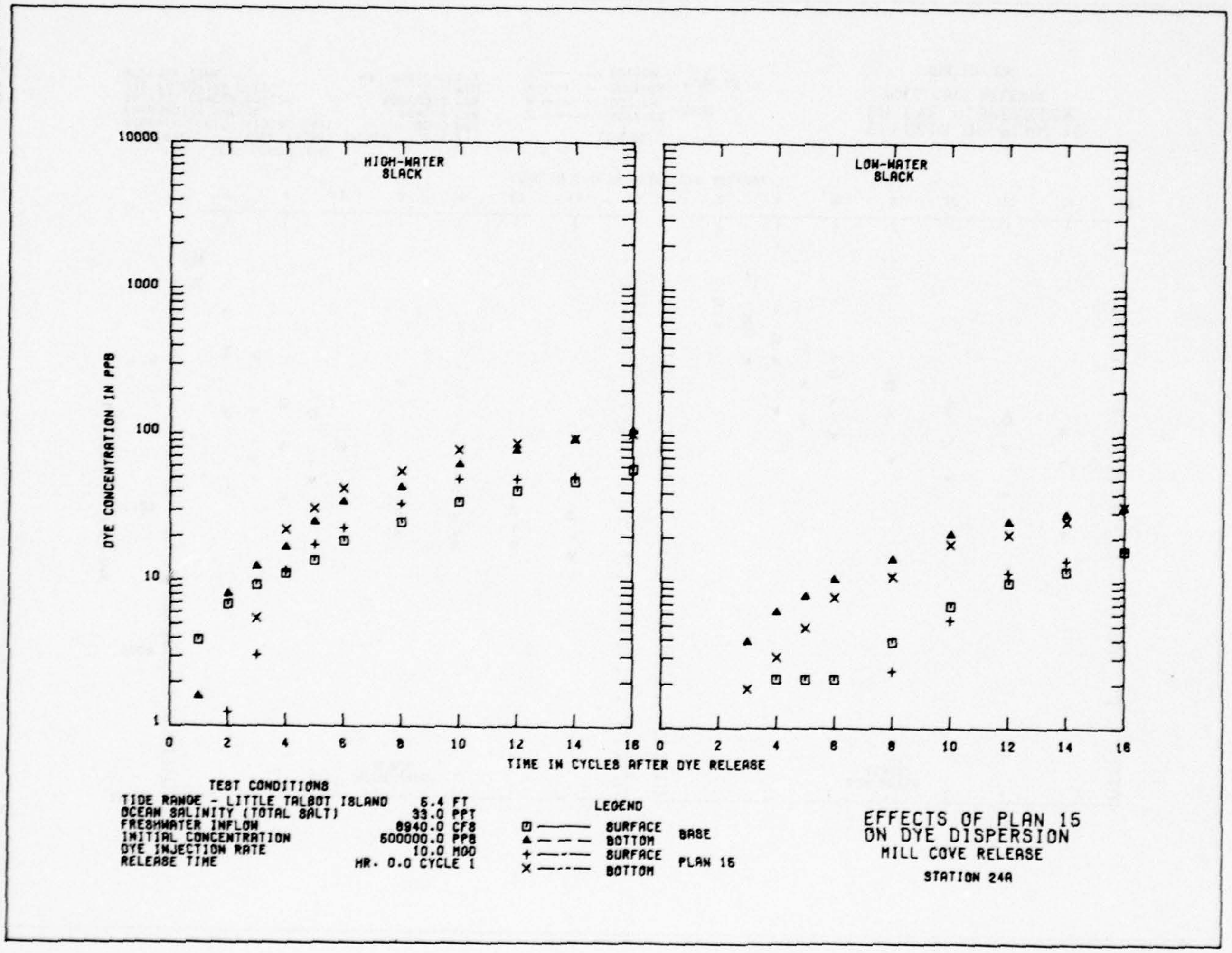
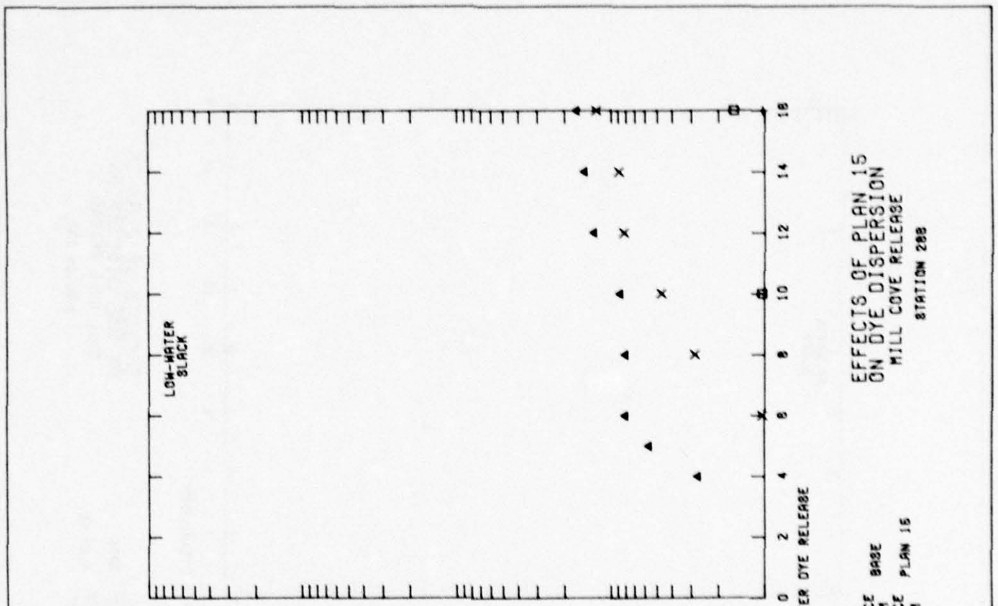
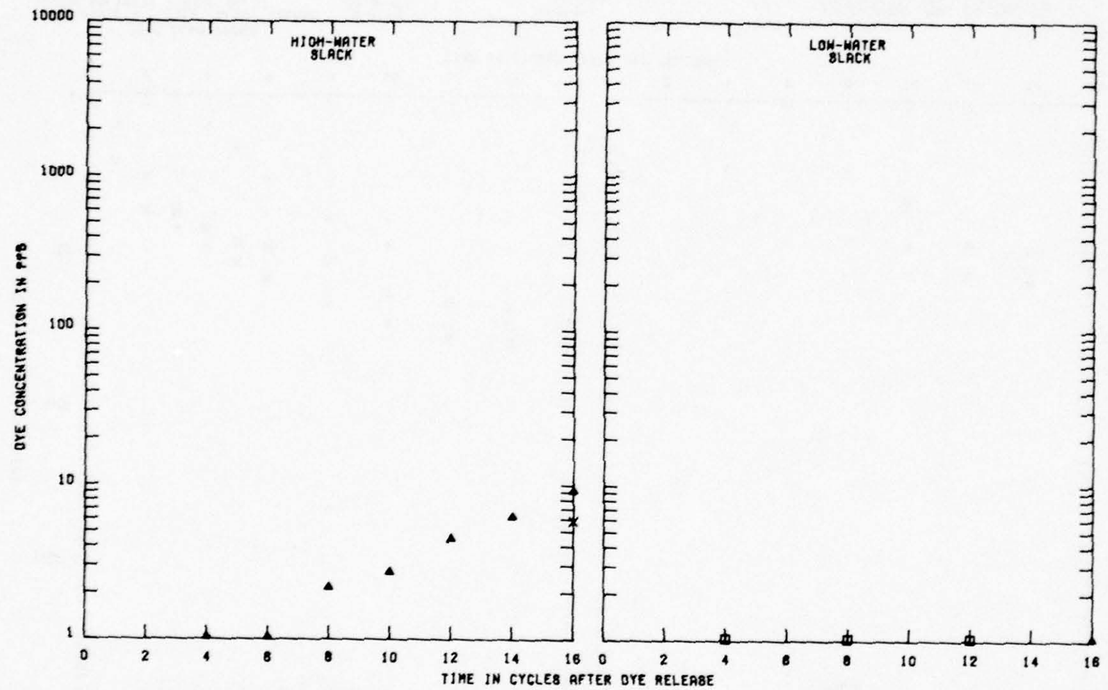

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0 2 4 6 8 10 12 14 16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE BASE
BOTTOM
SURFACE PLAN 15
BOTTOM
EFFECTS OF PLAN 15
ON DYE DISPERSION
MILL COVE RELEASE
STATION 24A

PLATE 70



HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0 2 4 6 8 10 12 14 16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE BASE
BOTTOM
SURFACE PLAN 15
BOTTOM
EFFECTS OF PLAN 15
ON DYE DISPERSION
MILL COVE RELEASE
STATION 288

PLATE 71



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	10.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

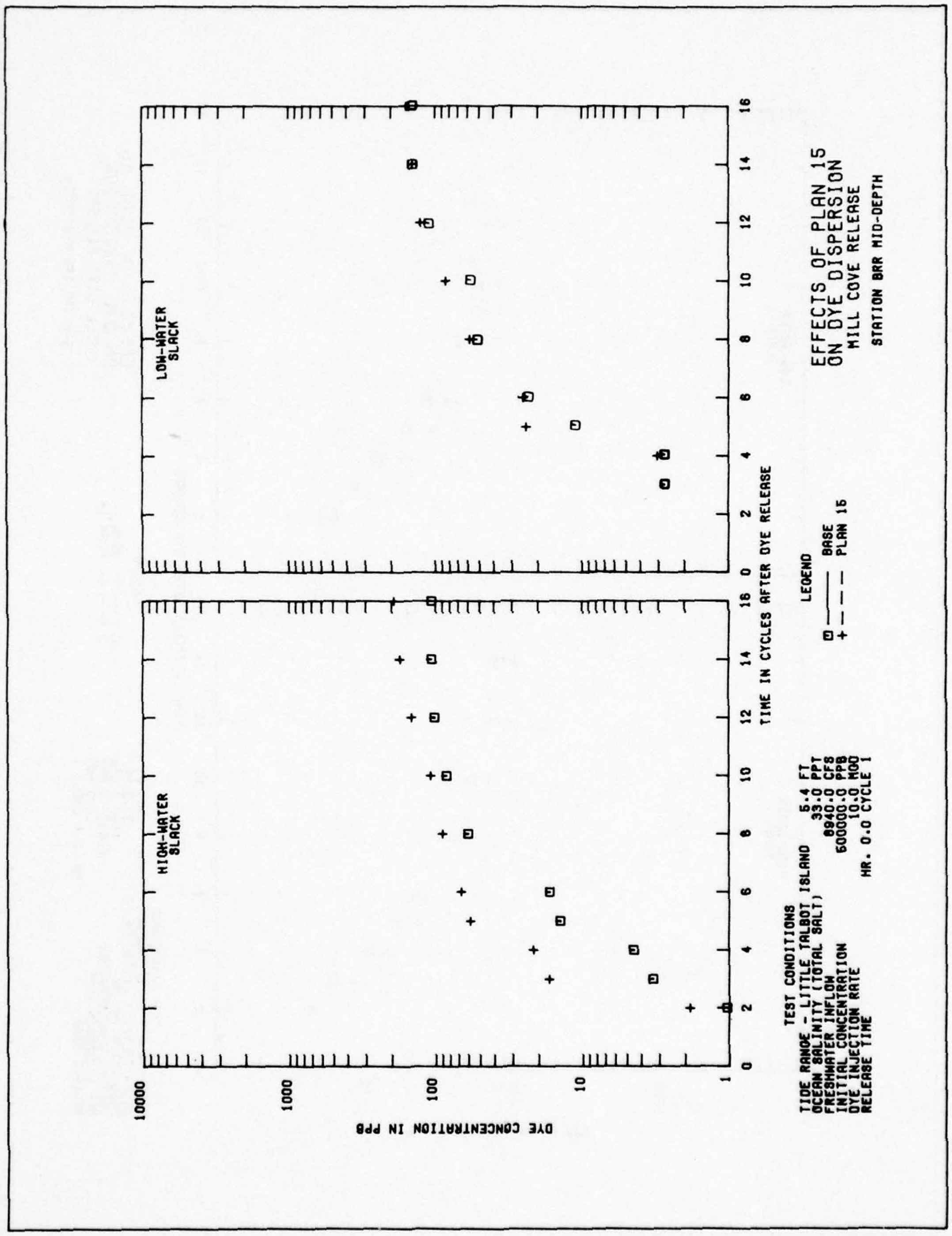
LEGEND

⊡ ———	SURFACE	BASE
▲ — — —	BOTTOM	BASE
+ —·—·—	SURFACE	PLAN 15
× —··—	BOTTOM	PLAN 15

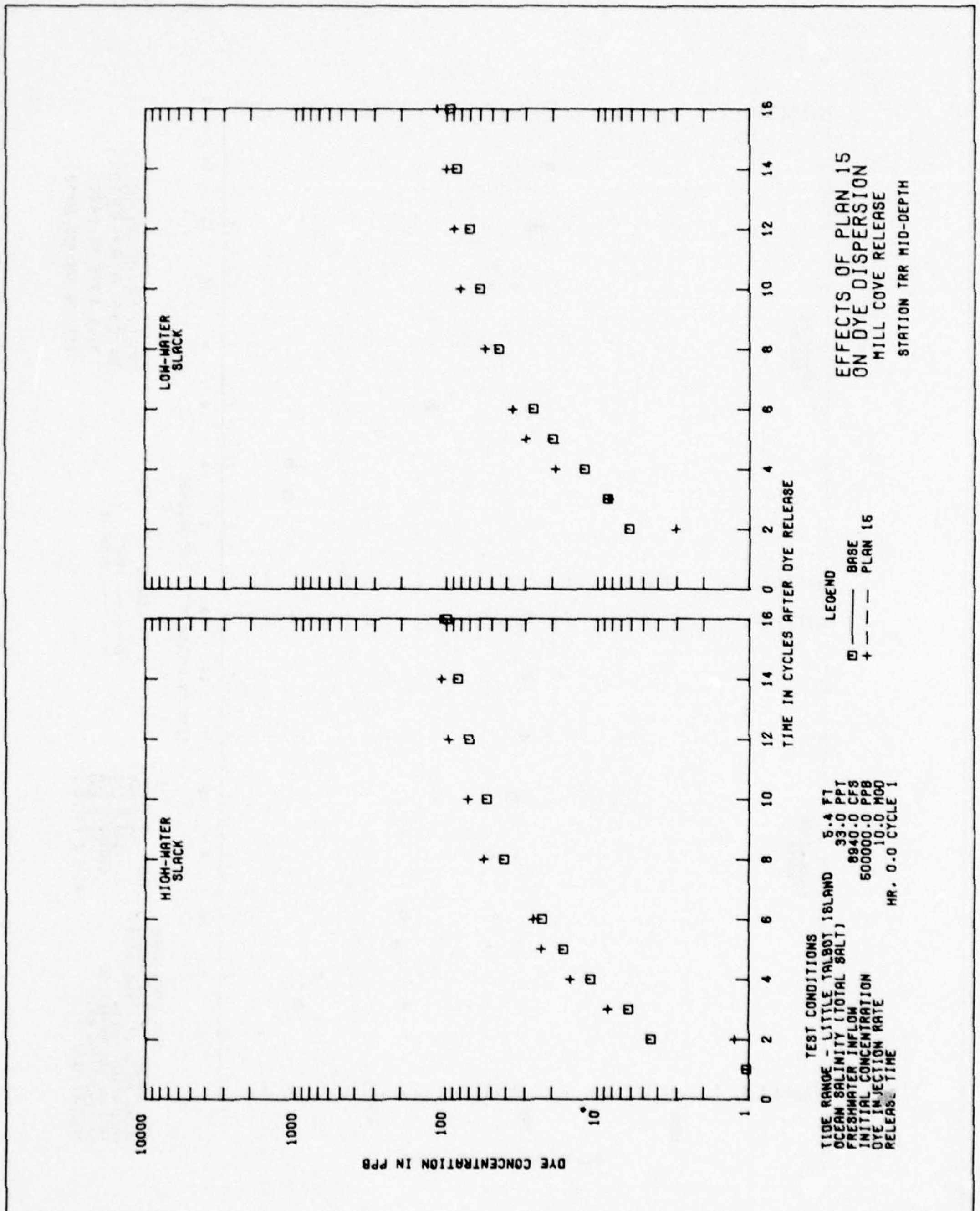
EFFECTS OF PLAN 15
ON DYE DISPERSION
MILL COVE RELEASE

STATION 33A

PLATE 72



EFFECTS OF PLAN 15
ON DYE DISPERSION
MILL COVE RELEASE
STATION BRR MID-DEPTH
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
TIME IN CYCLES AFTER DYE RELEASE
0
2
4
6
8
10
12
14
16
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8840.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 10.0 MOO
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
BASE
PLAN 15



EFFECTS OF PLAN 15
ON DYE DISPERSION
MILL COVE RELEASE
STATION TRR MID-DEPTH
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
TIME IN CYCLES AFTER DYE RELEASE
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
LEGEND
BASE
PLAN 15
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MOO
RELEASE TIME HR. 0.0 CYCLE 1

PLATE 74

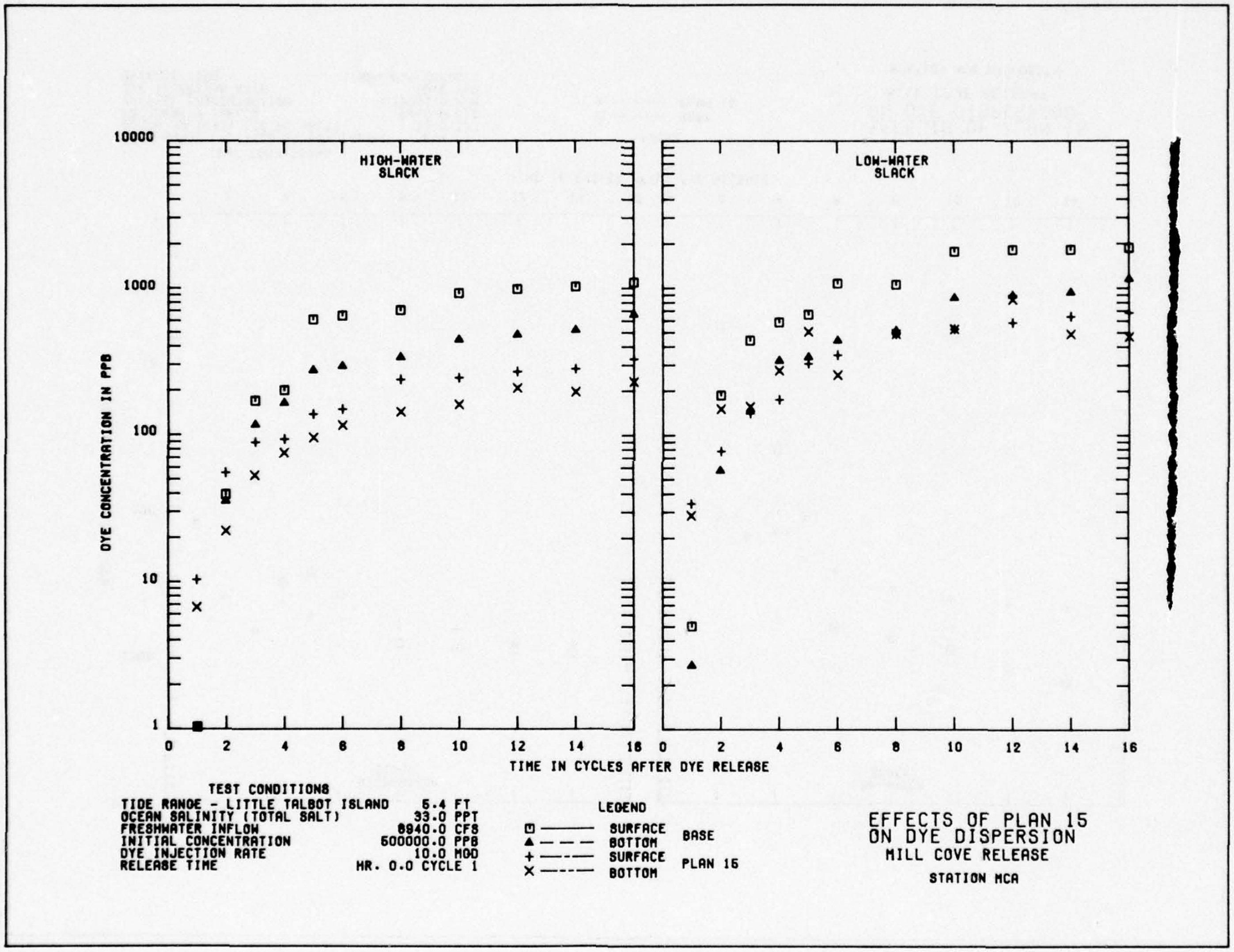
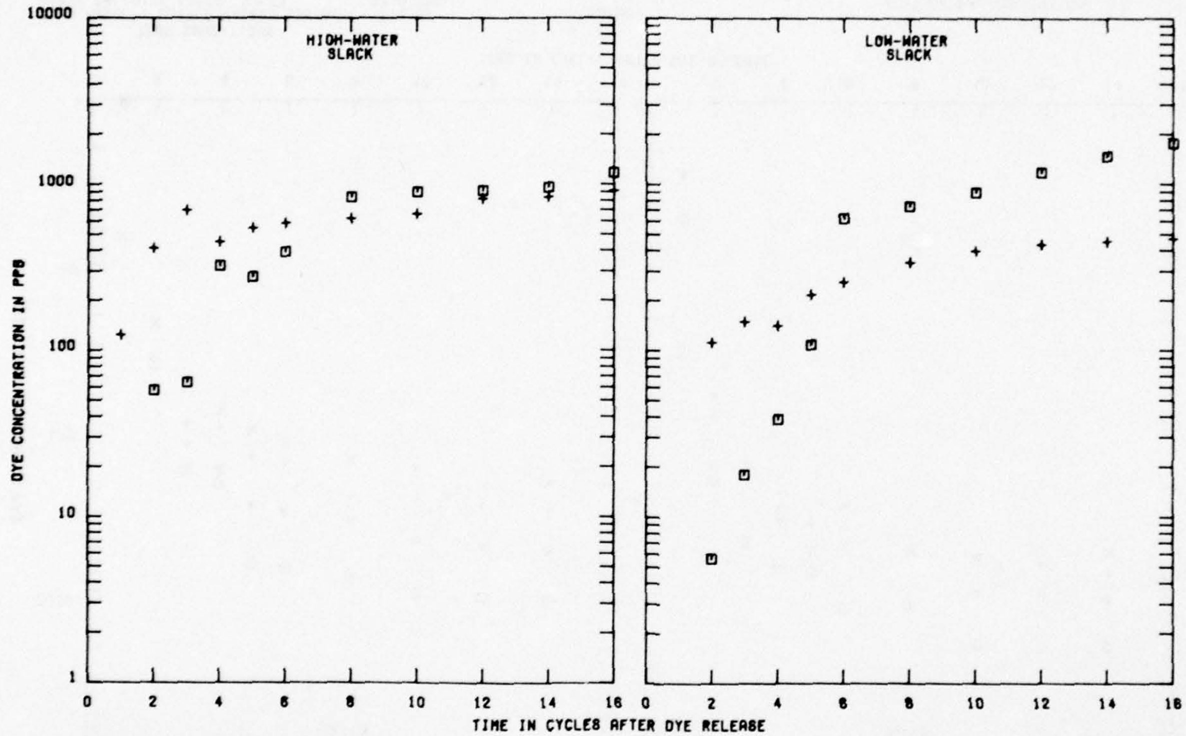

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0 2 4 6 8 10 12 14 16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 6940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 15
EFFECTS OF PLAN 15
ON DYE DISPERSION
MILL COVE RELEASE
STATION MCA

PLATE 75



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	10.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

⊡ ——— BASE
\+ — — — PLAN 15

EFFECTS OF PLAN 15
ON DYE DISPERSION
MILL COVE RELEASE
STATION MCB MID-DEPTH

PLATE 76

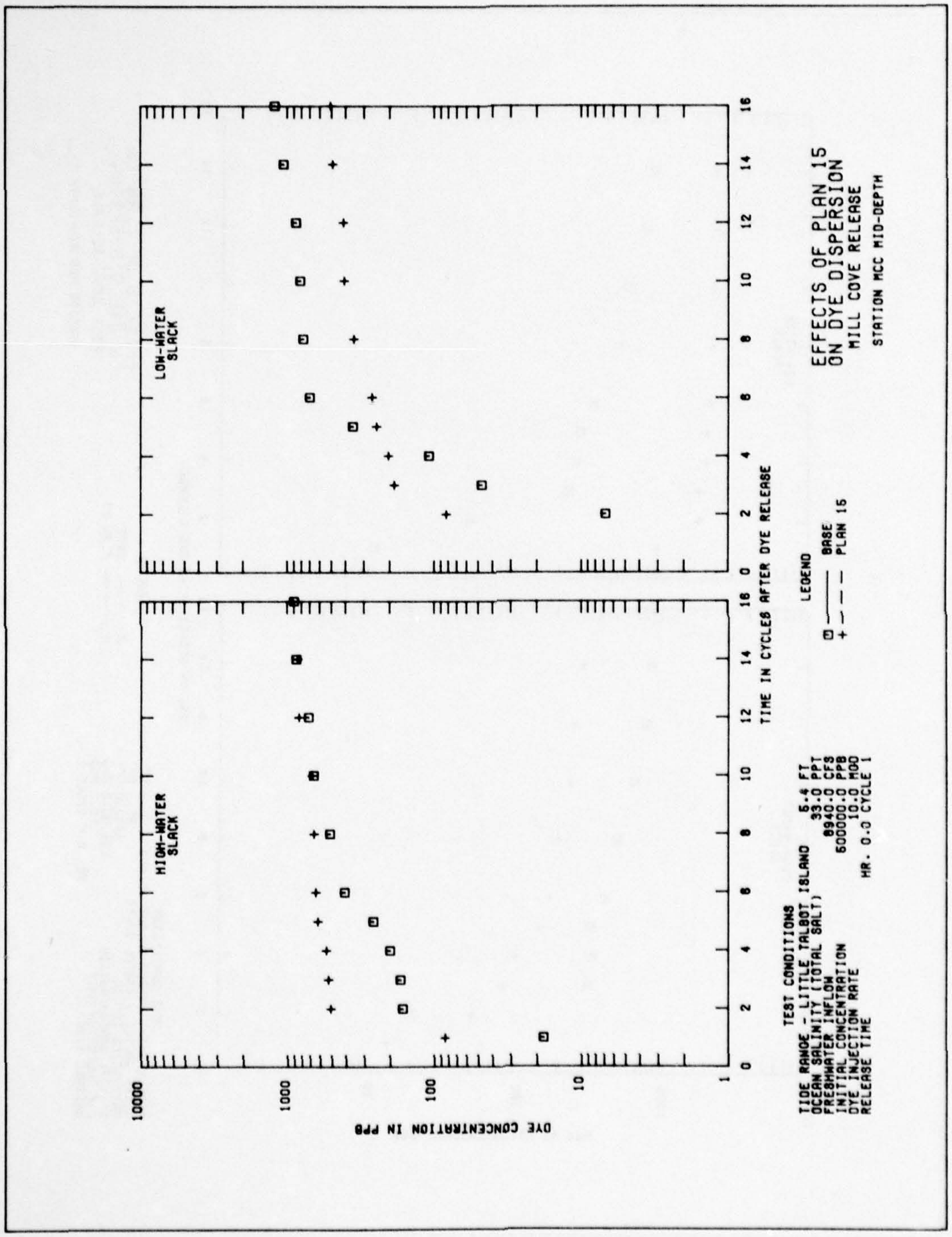

EFFECTS OF PLAN 15
ON DYE DISPERSION
MILL COVE RELEASE
STATION MCC MID-DEPTH
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
TIME IN CYCLES AFTER DYE RELEASE
LEGEND
BASE
PLAN 15
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1

PLATE 77

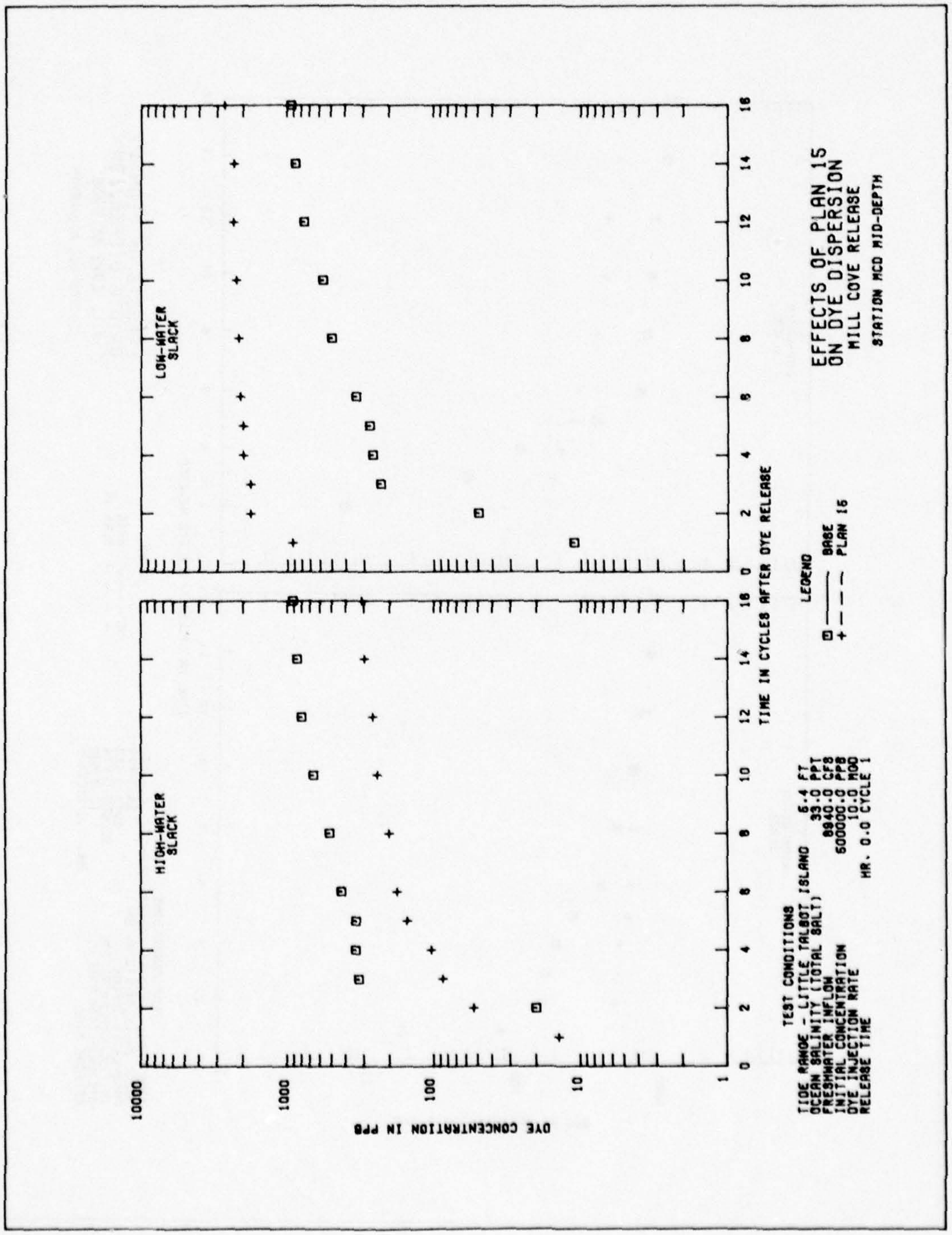

EFFECTS OF PLAN 15
ON DYE DISPERSION
MILL COVE RELEASE
STATION MCD MID-DEPTH
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
TIME IN CYCLES AFTER DYE RELEASE
LEGEND
BASE
PLAN 15
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1

PLATE 78

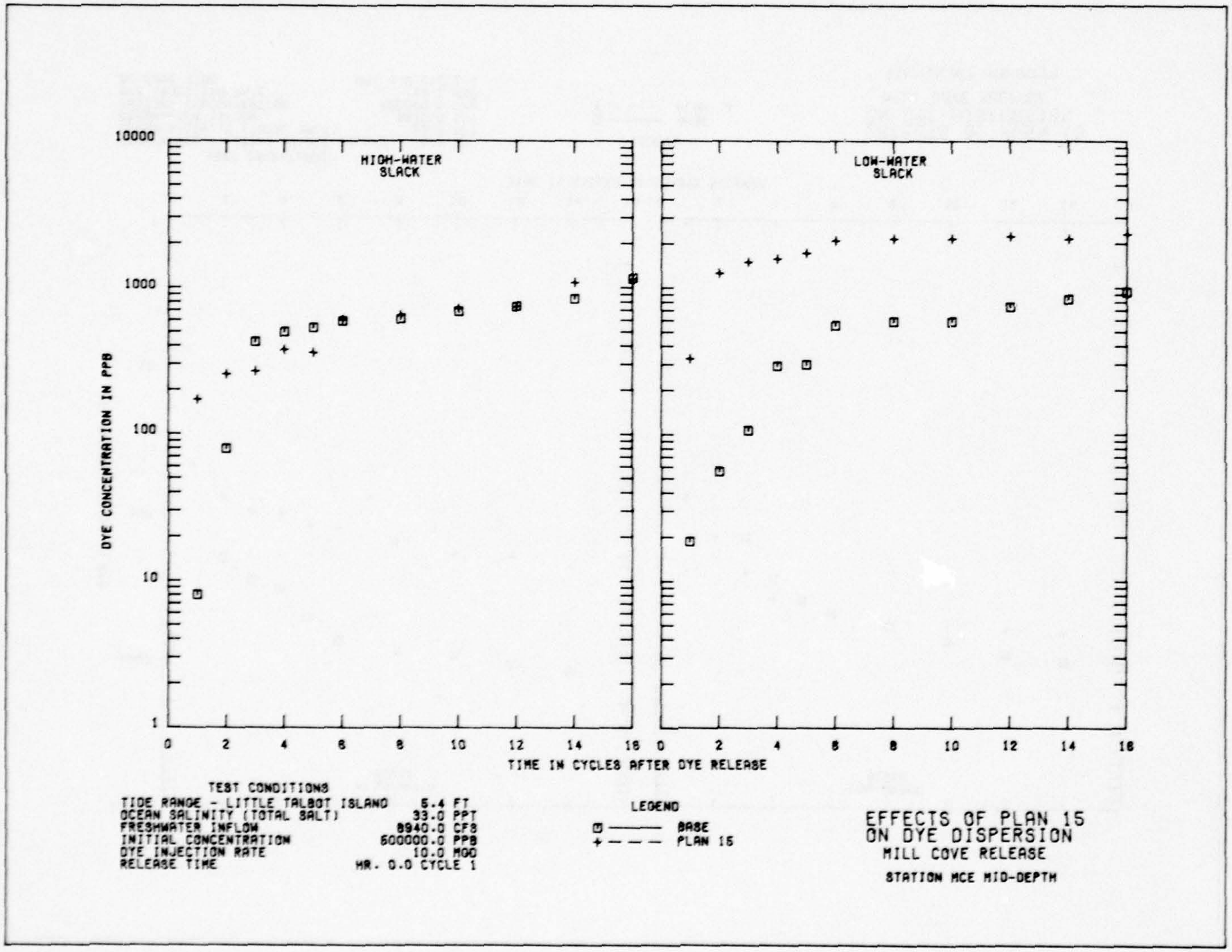
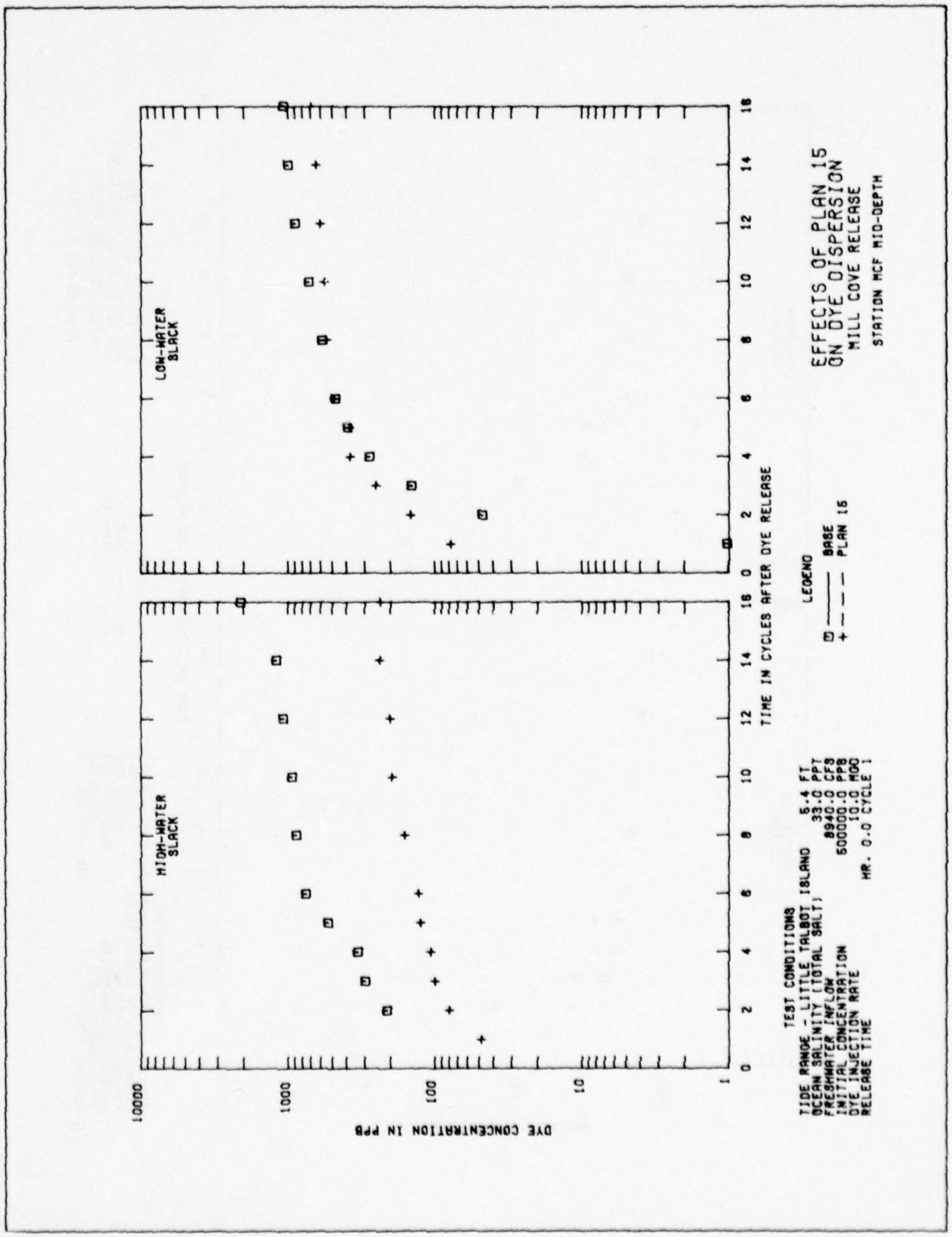
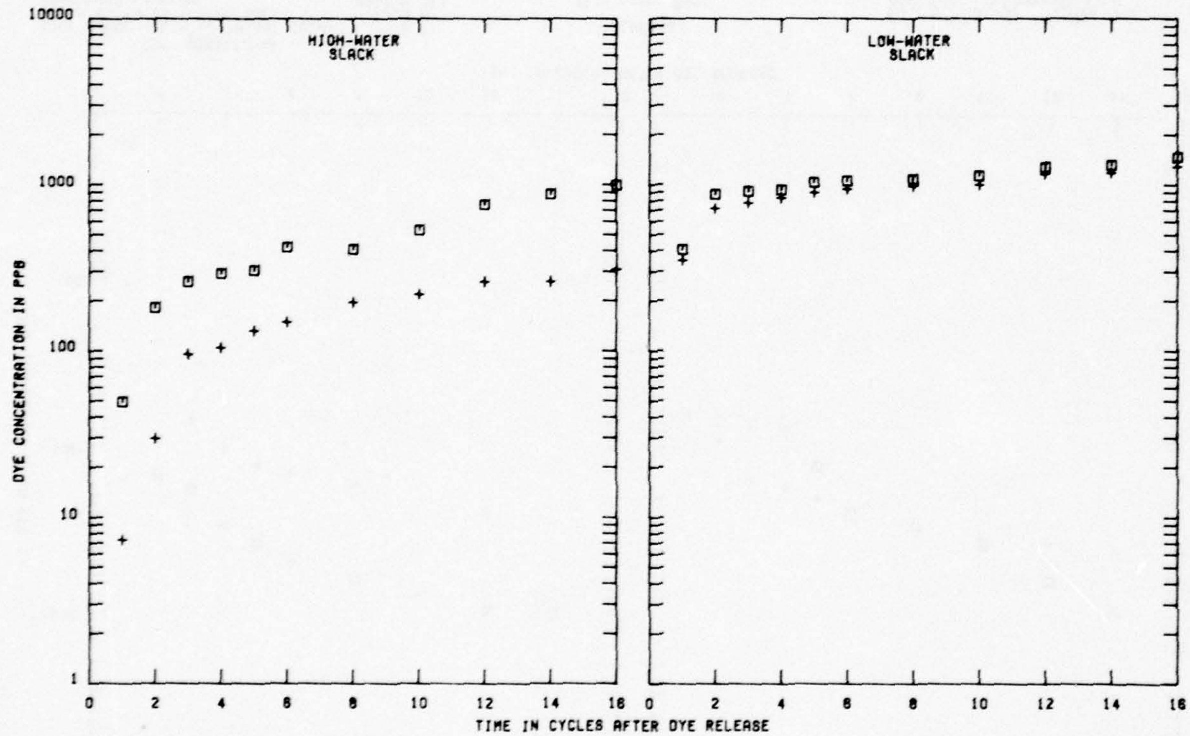

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
BASE
PLAN 15
EFFECTS OF PLAN 15
ON DYE DISPERSION
MILL COVE RELEASE
STATION MCE MID-DEPTH

PLATE 79



HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
BASE
PLAN 15
EFFECTS OF PLAN 15
ON DYE DISPERSION
MILL COVE RELEASE
STATION MCF MID-DEPTH

PLATE 80



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	600000.0 PPB
DYE INJECTION RATE	10.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

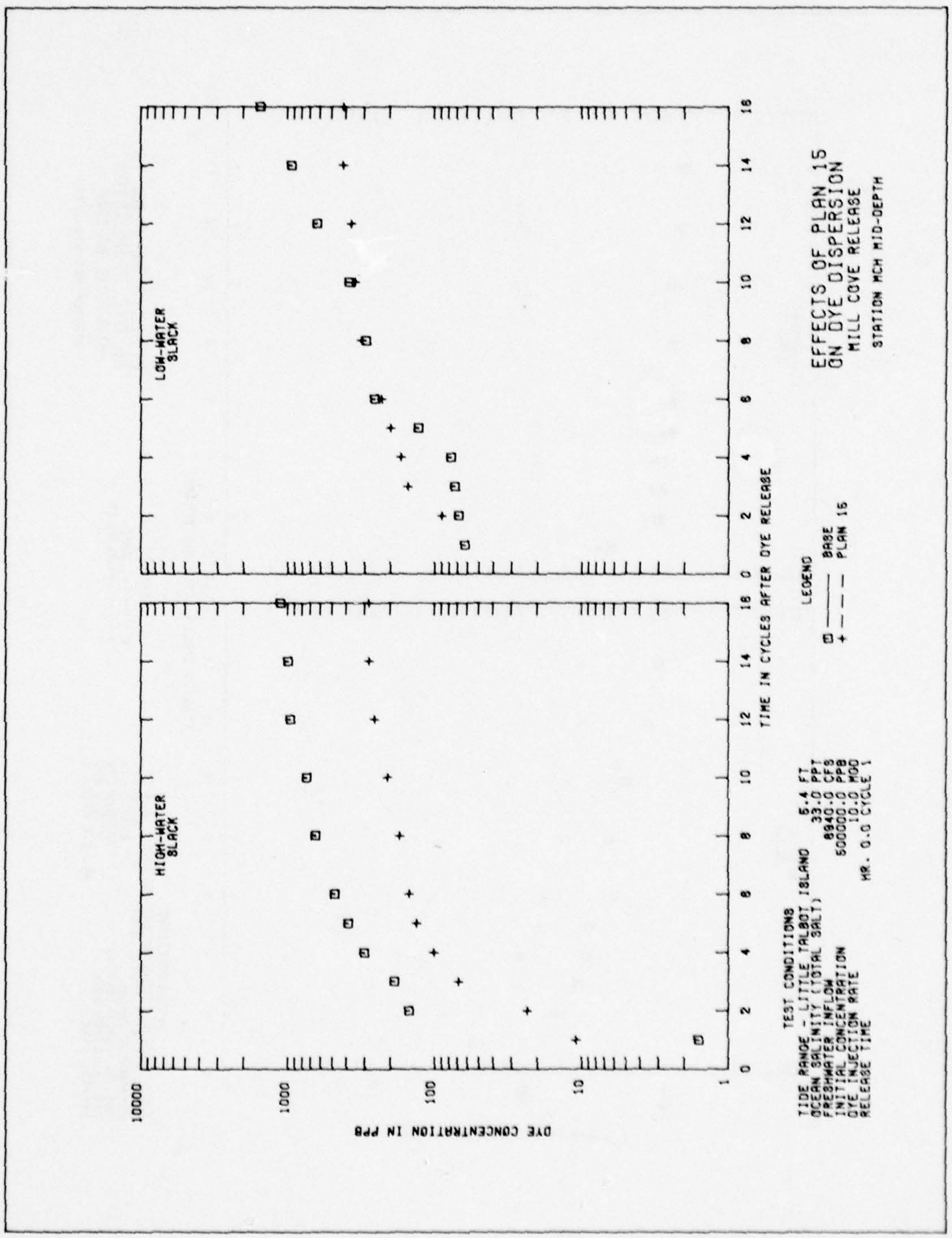
LEGEND

⊡ ——— BASE
\+ — — — PLAN 16

EFFECTS OF PLAN 15
ON DYE DISPERSION
MILL COVE RELEASE

STATION MCG MID-DEPTH

PLATE 81



HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MOO
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
BASE
PLAN 15
EFFECTS OF PLAN 15
ON DYE DISPERSION
MILL COVE RELEASE
STATION MCH MID-DEPTH

PLATE 82

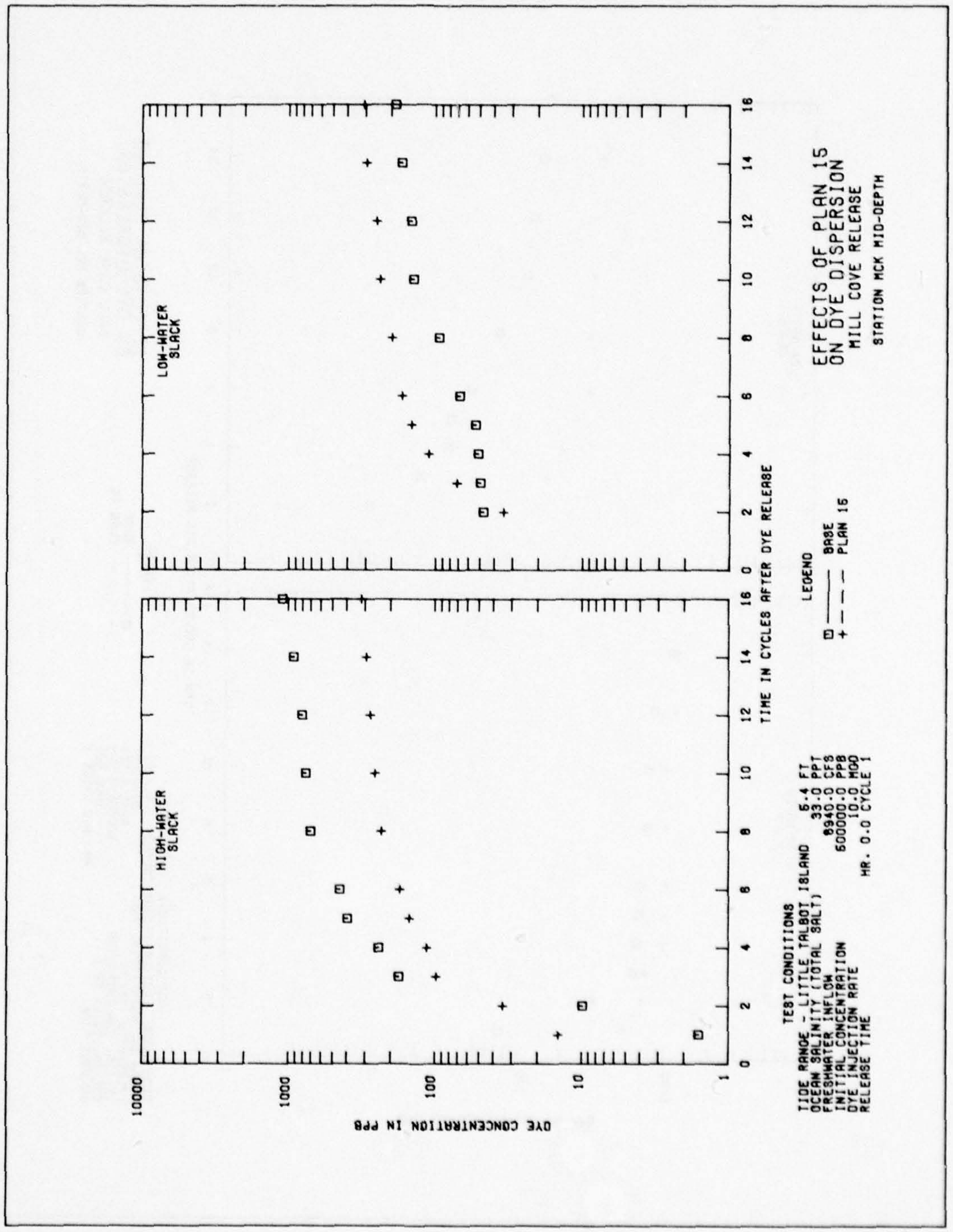

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
LEGEND
BASE
PLAN 15
EFFECTS OF PLAN 15 ON DYE DISPERSION
MILL COVE RELEASE
STATION MCK MID-DEPTH
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1

PLATE 83

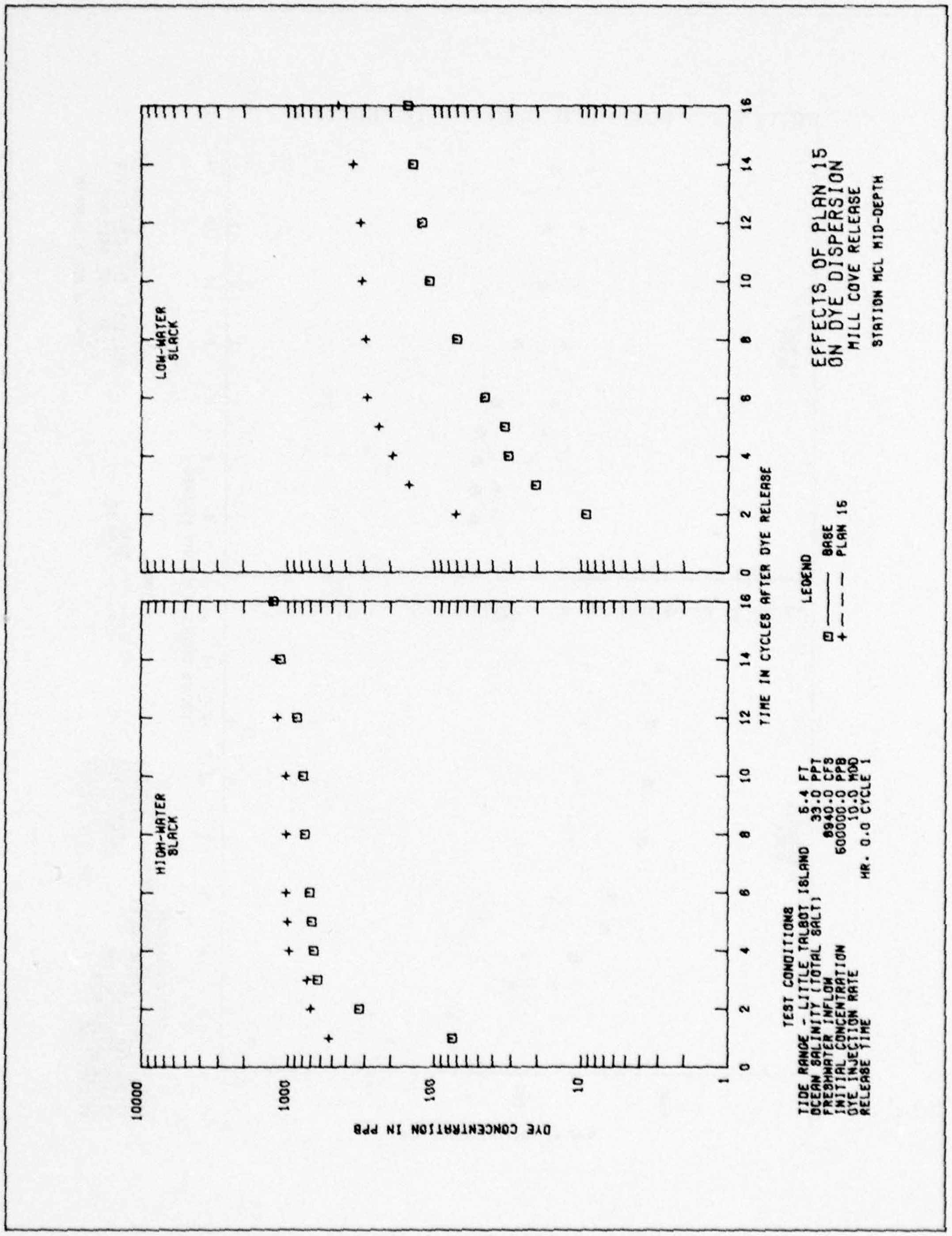

EFFECTS OF PLAN 15
ON DYE DISPERSION
MILL COVE RELEASE
STATION MCL MID-DEPTH
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
TIME IN CYCLES AFTER DYE RELEASE
0
2
4
6
8
10
12
14
16
LEGEND
BASE
PLAN 15
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1

PLATE 84

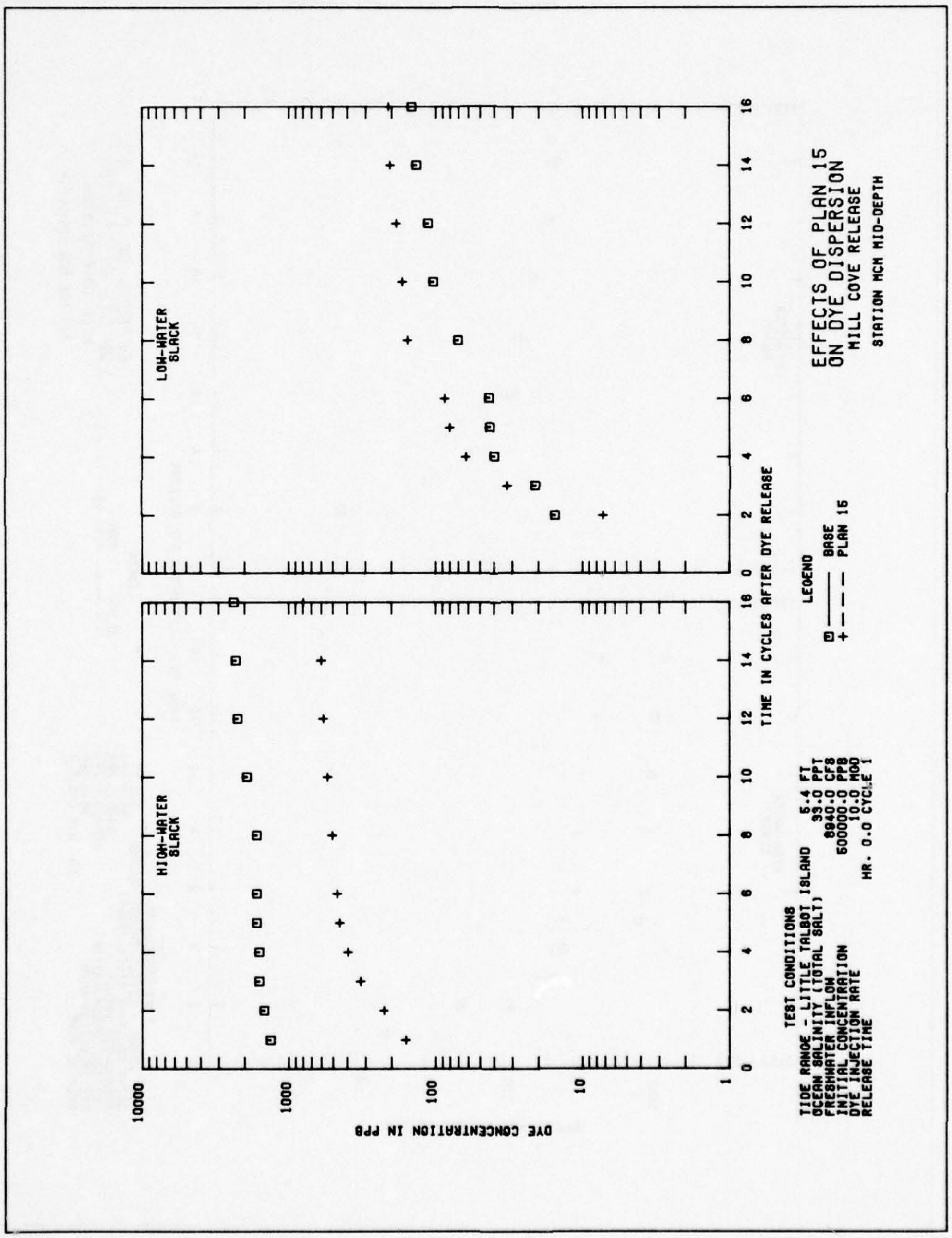
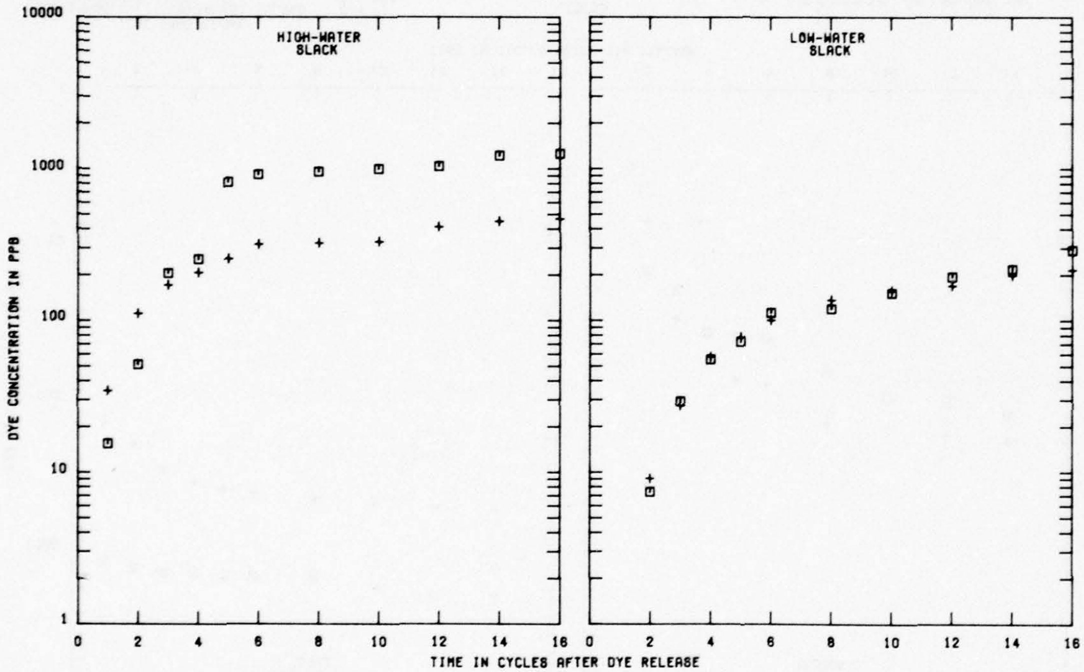

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0 2 4 6 8 10 12 14 16
TIME IN CYCLES AFTER DYE RELEASE
LEGEND
BASE
PLAN 15
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
EFFECTS OF PLAN 15
ON DYE DISPERSION
MILL COVE RELEASE
STATION MCM MID-DEPTH

PLATE 85



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	10.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

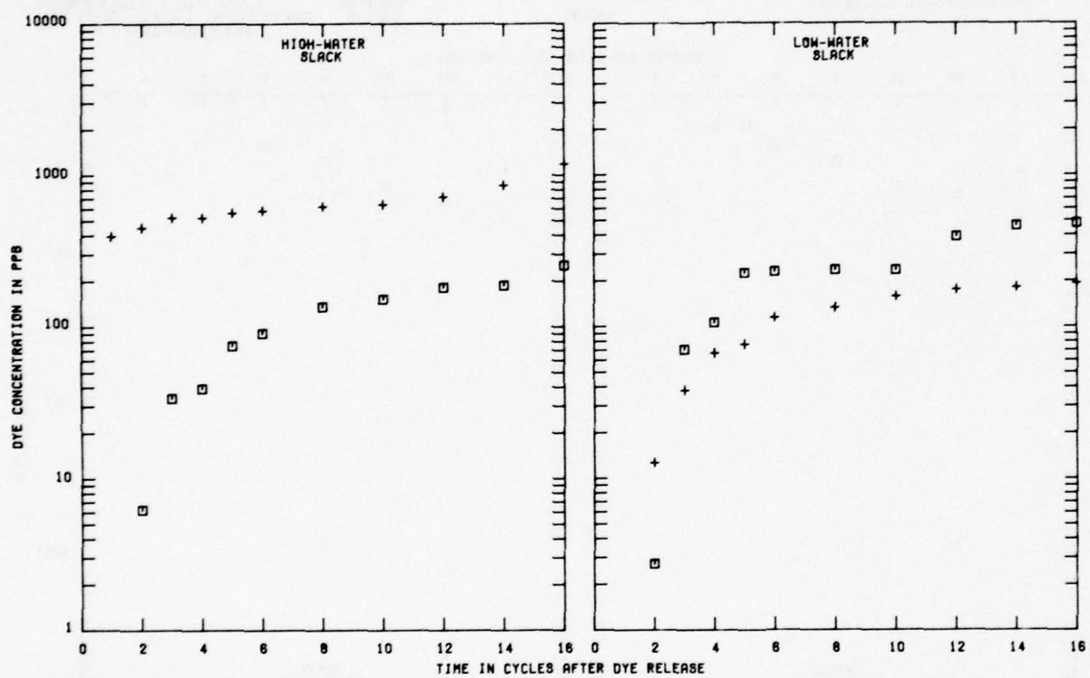
LEGEND

⊡ ——— BASE
\+ — — — PLAN 15

EFFECTS OF PLAN 15
ON DYE DISPERSION
MILL COVE RELEASE

STATION MCN MID-DEPTH

PLATE 86



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	10.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

⊡ ——— BASE
+ — — — PLAN 15

EFFECTS OF PLAN 15
ON DYE DISPERSION
MILL COVE RELEASE

STATION MCP MID-DEPTH

PLATE 87

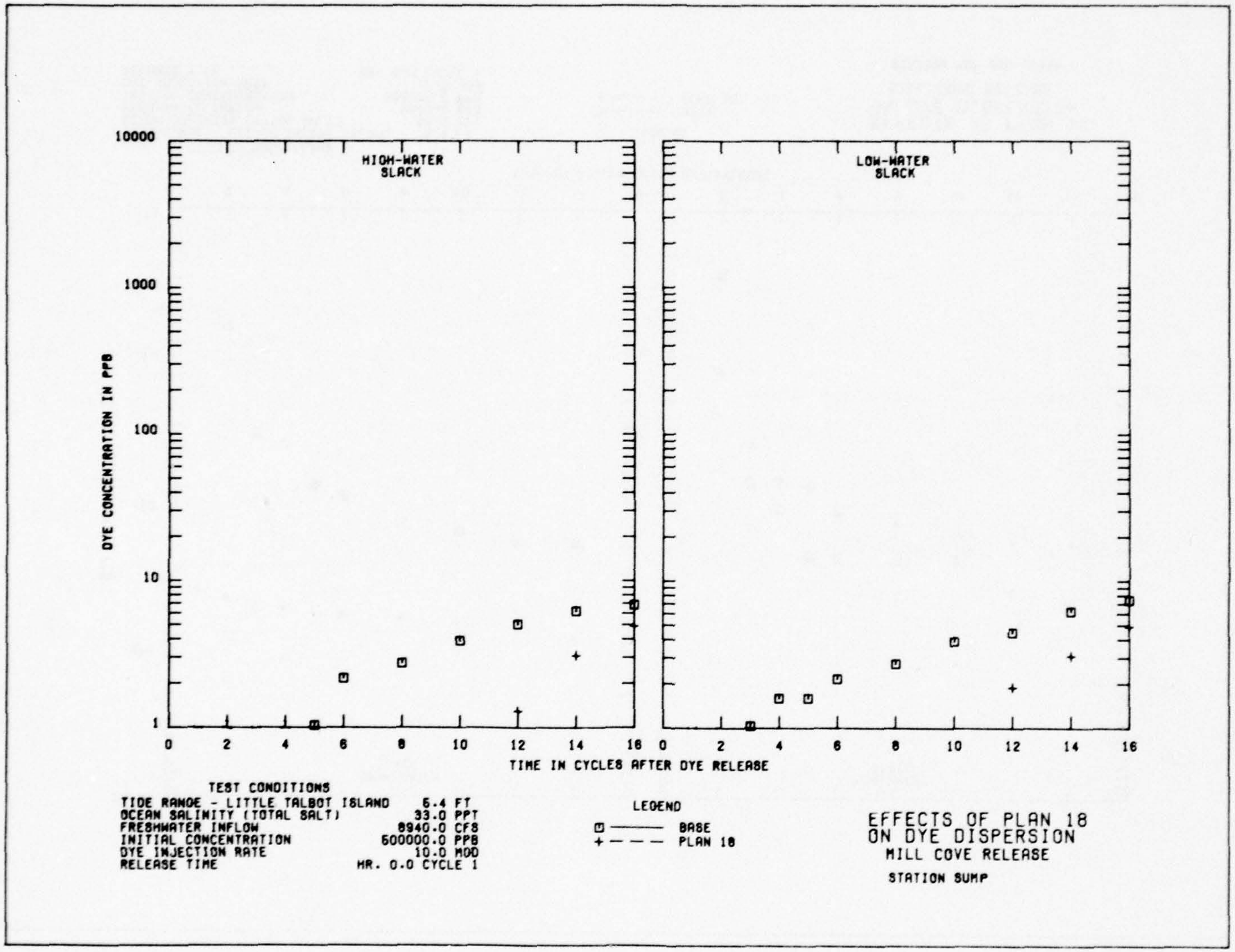

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0 2 4 6 8 10 12 14 16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
BASE
PLAN 18
EFFECTS OF PLAN 18
ON DYE DISPERSION
MILL COVE RELEASE
STATION SUMP

PLATE 88

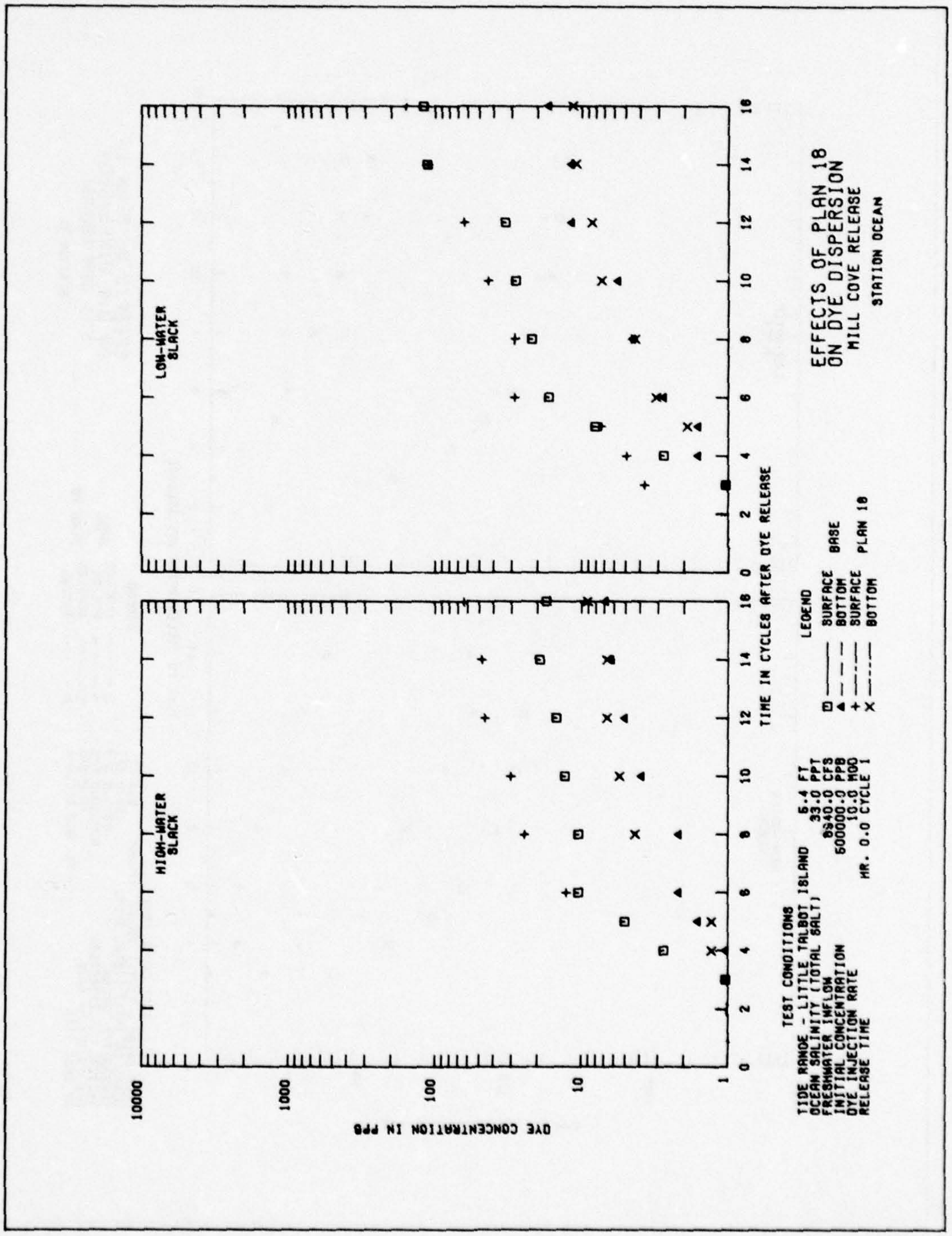
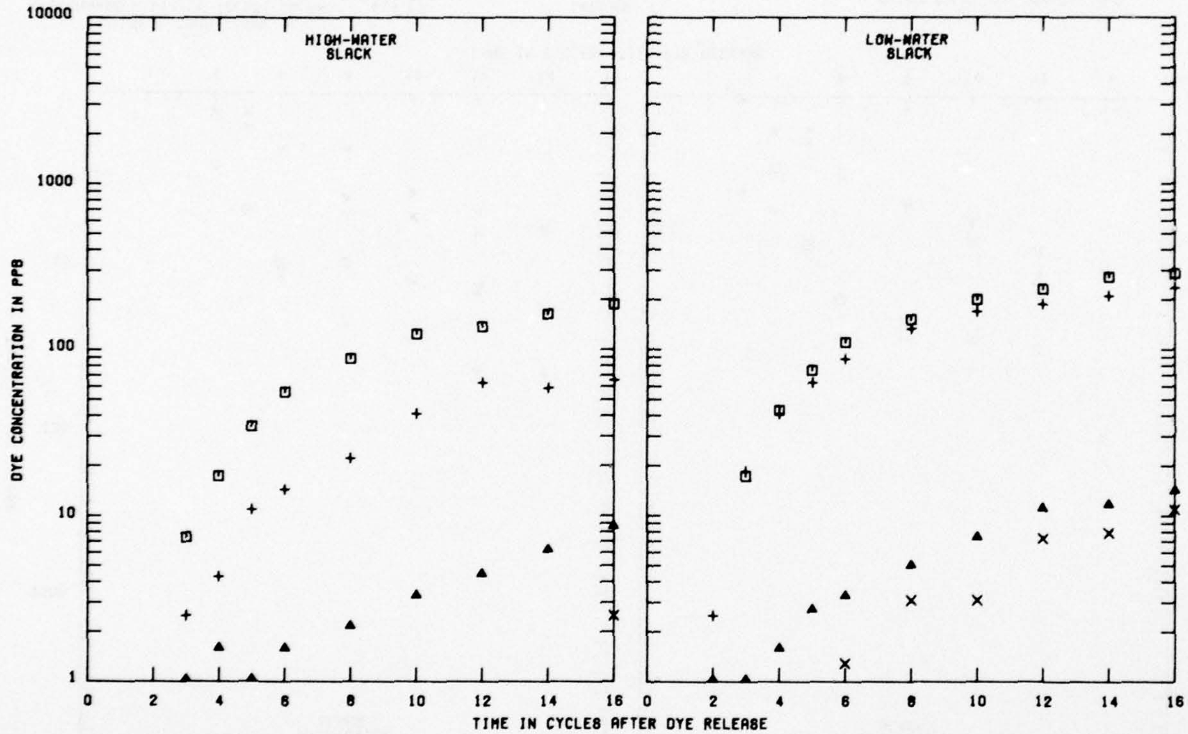

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 10.0 MOO
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 18
EFFECTS OF PLAN 18
ON DYE DISPERSION
MILL COVE RELEASE
STATION OCEAN

PLATE 89

PLATE 90



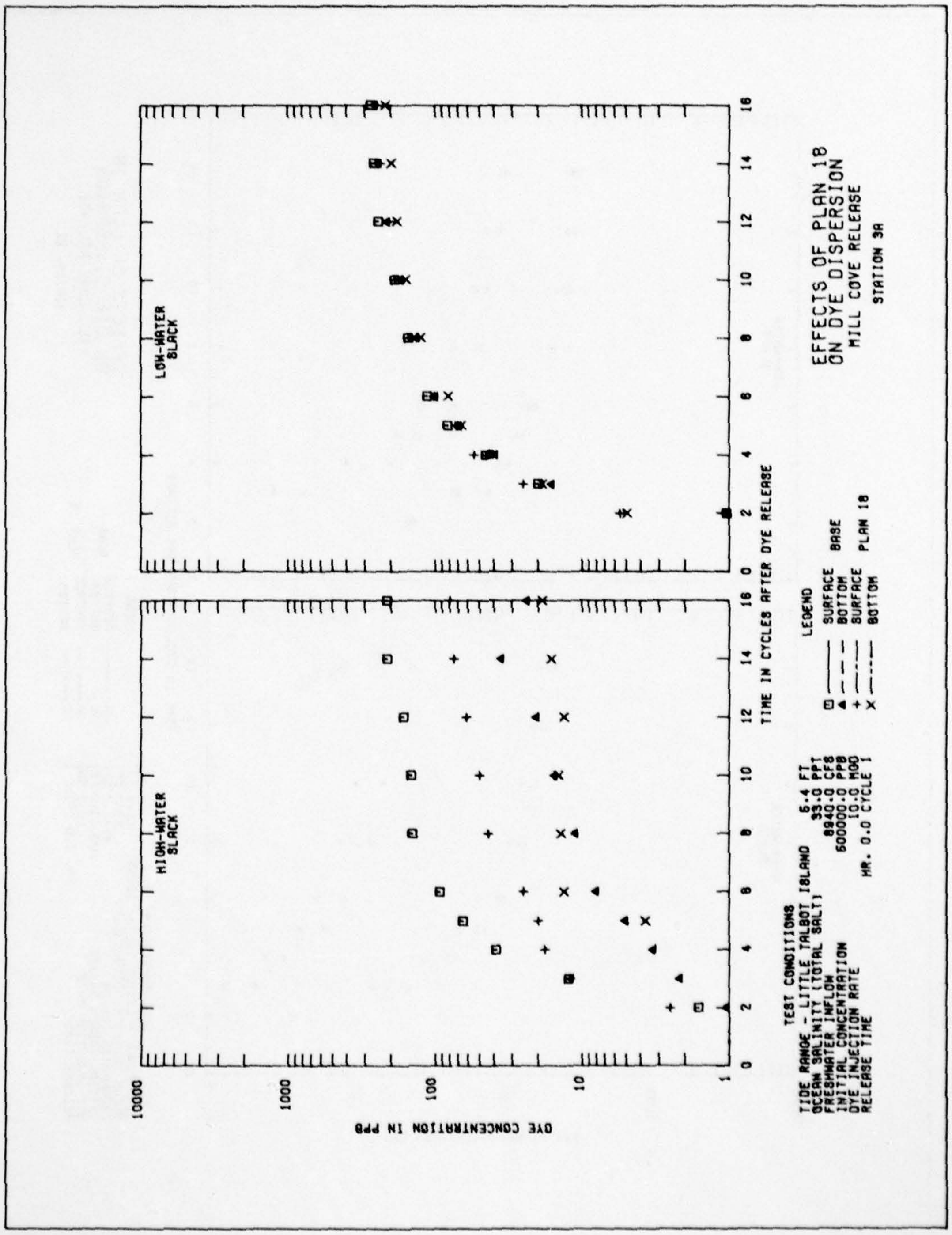
TEST CONDITIONS

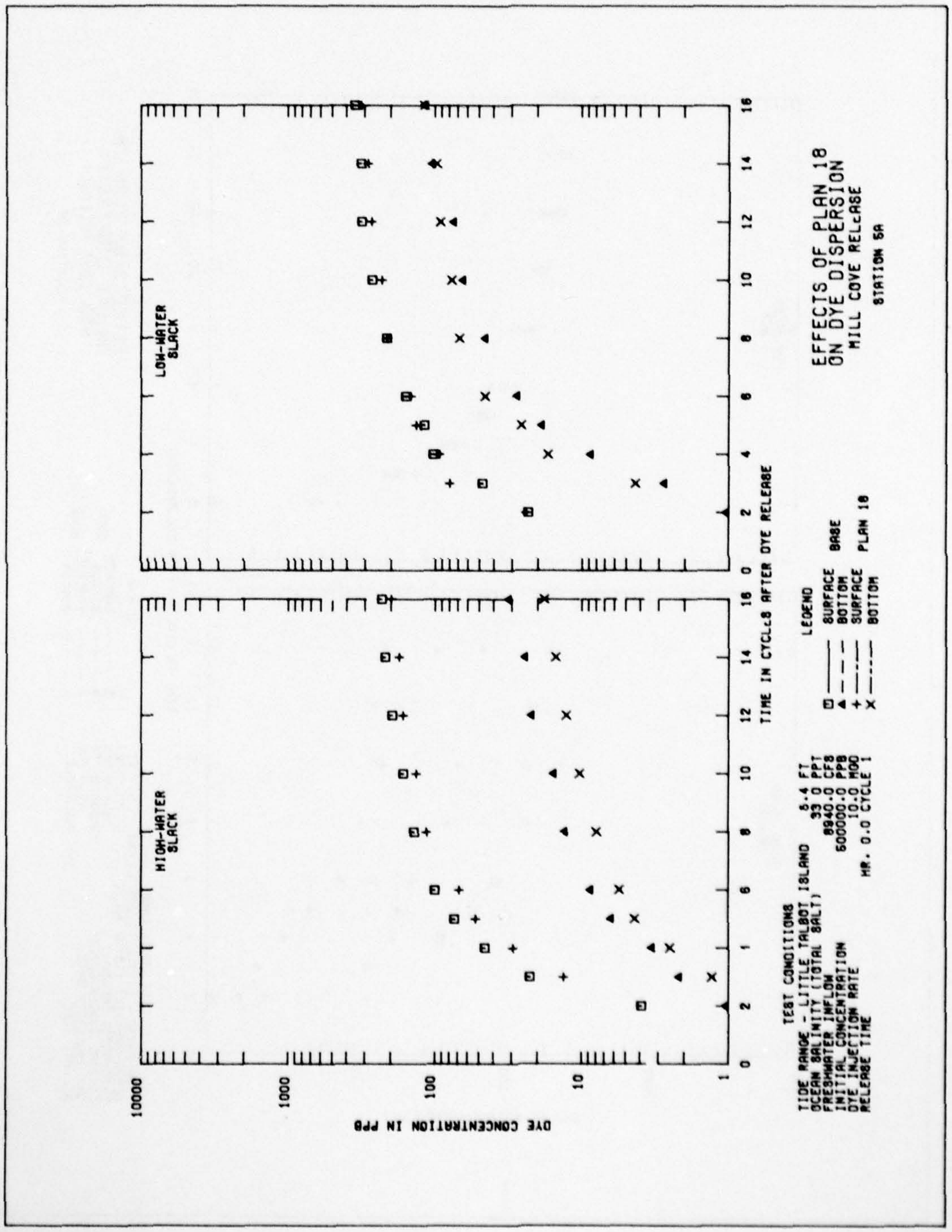
TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	600000.0 PPB
DYE INJECTION RATE	10.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

⊡ ———	SURFACE	BASE
▲ — — —	BOTTOM	
+ —·—·—	SURFACE	PLAN 18
× —··—··—	BOTTOM	

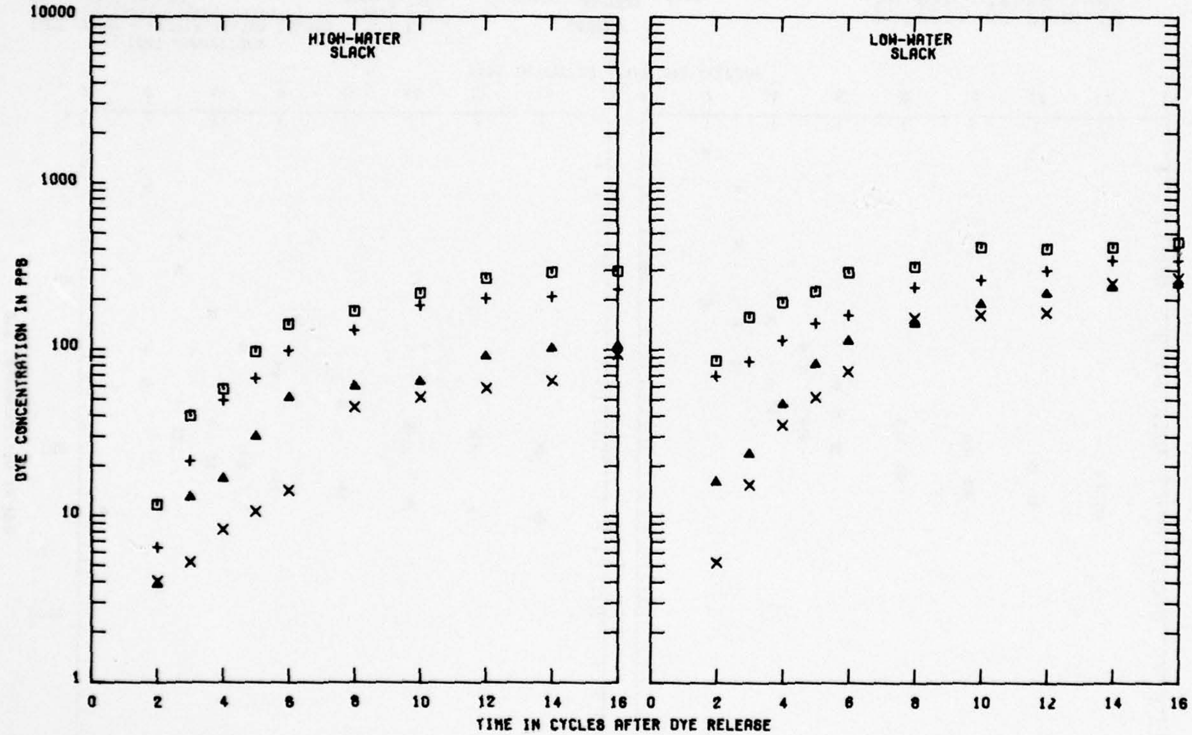
EFFECTS OF PLAN 18
ON DYE DISPERSION
MILL COVE RELEASE
STATION 08


HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 6.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE BASE
BOTTOM
SURFACE PLAN 1B
BOTTOM
EFFECTS OF PLAN 1B
ON DYE DISPERSION
MILL COVE RELEASE
STATION 3A



EFFECTS OF PLAN 18
ON DYE DISPERSION
MILL COVE RELEASE
STATION 5A
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
TIME IN CYCLES AFTER DYE RELEASE
0
2
4
6
8
10
12
14
16
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 18

PLATE 92



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	600000.0 PPB
DYE INJECTION RATE	10.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

⊡ ———	SURFACE	BASE
▲ — — —	BOTTOM	
+ —·—·—	SURFACE	PLAN 18
× —··—··	BOTTOM	

EFFECTS OF PLAN 18
ON DYE DISPERSION
MILL COVE RELEASE

STATION 78

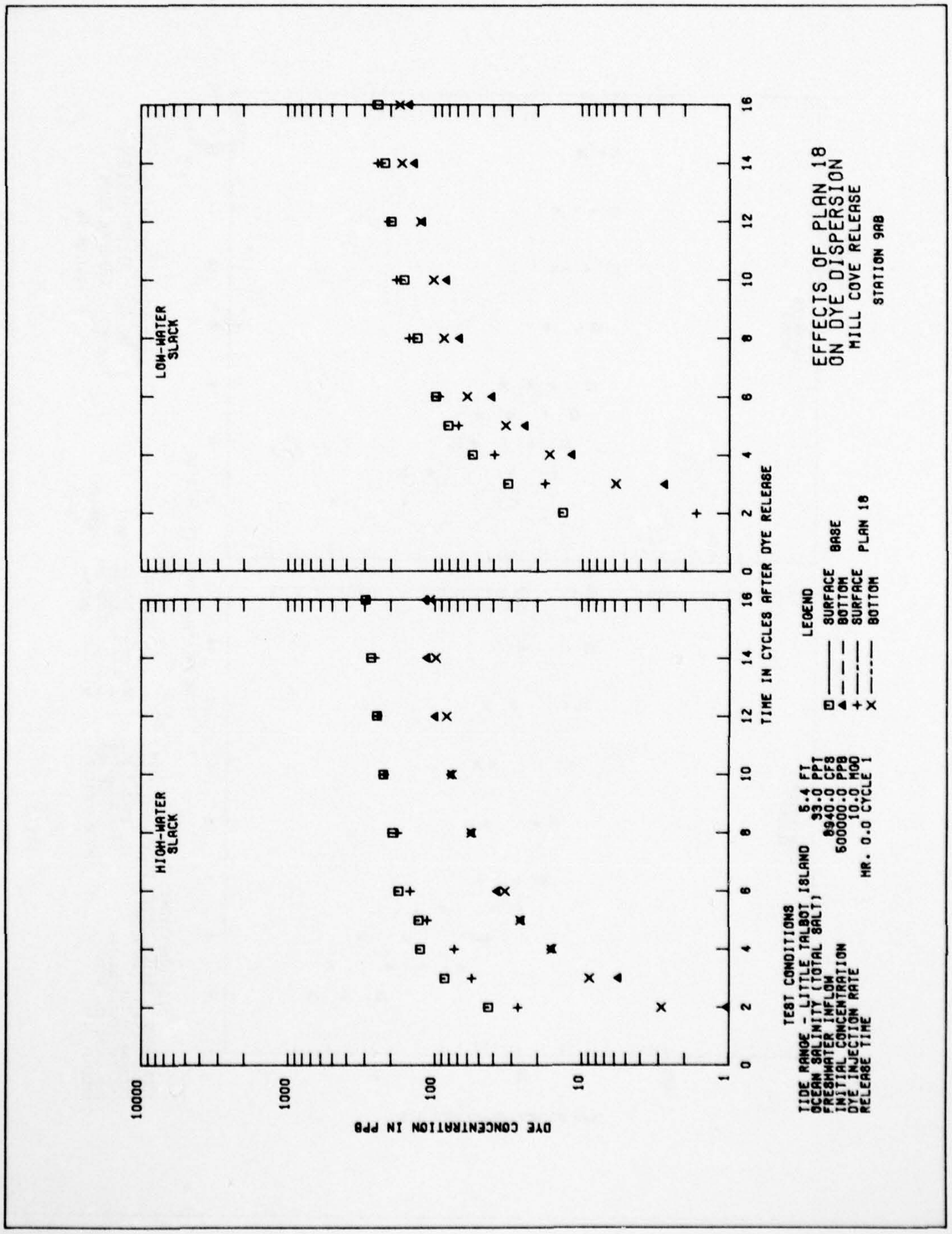
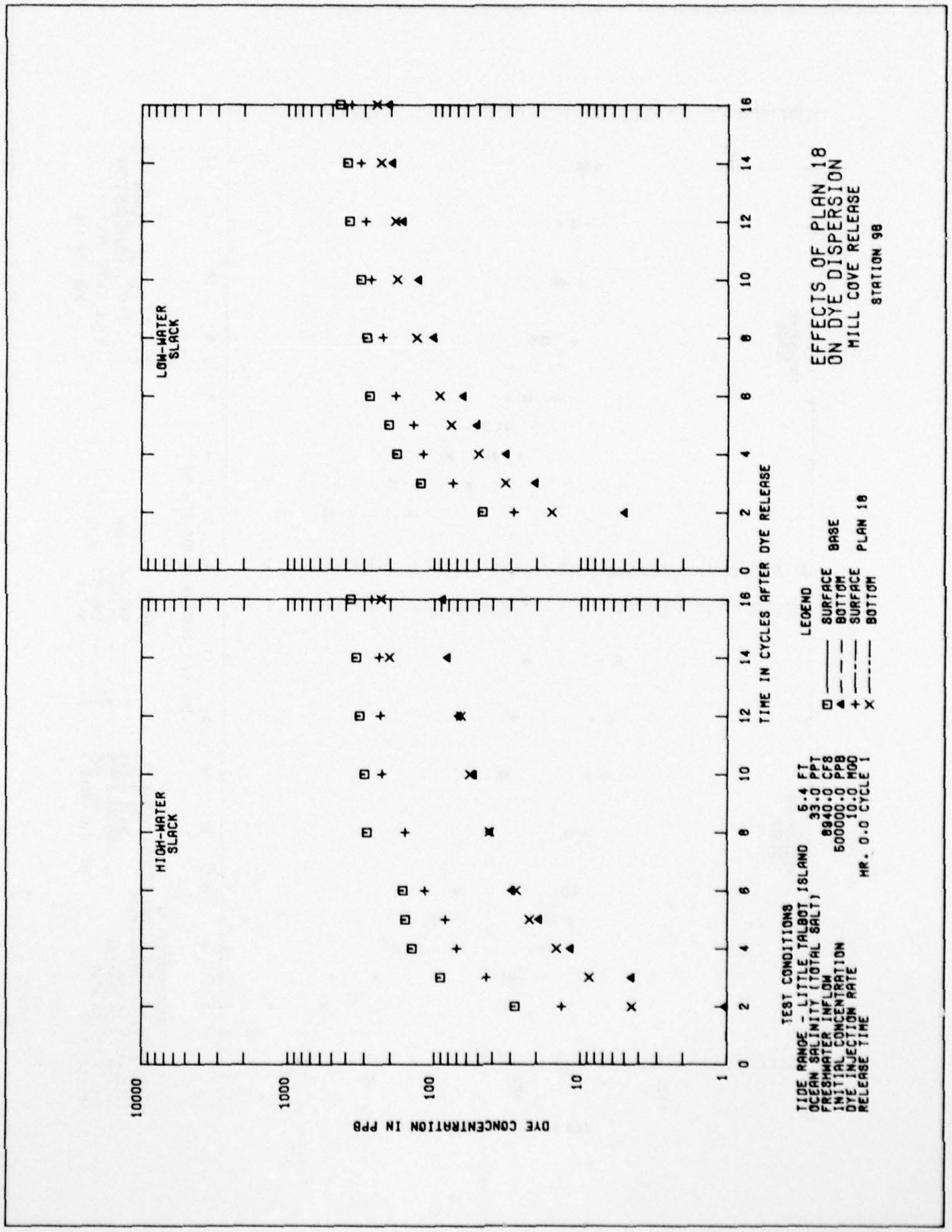
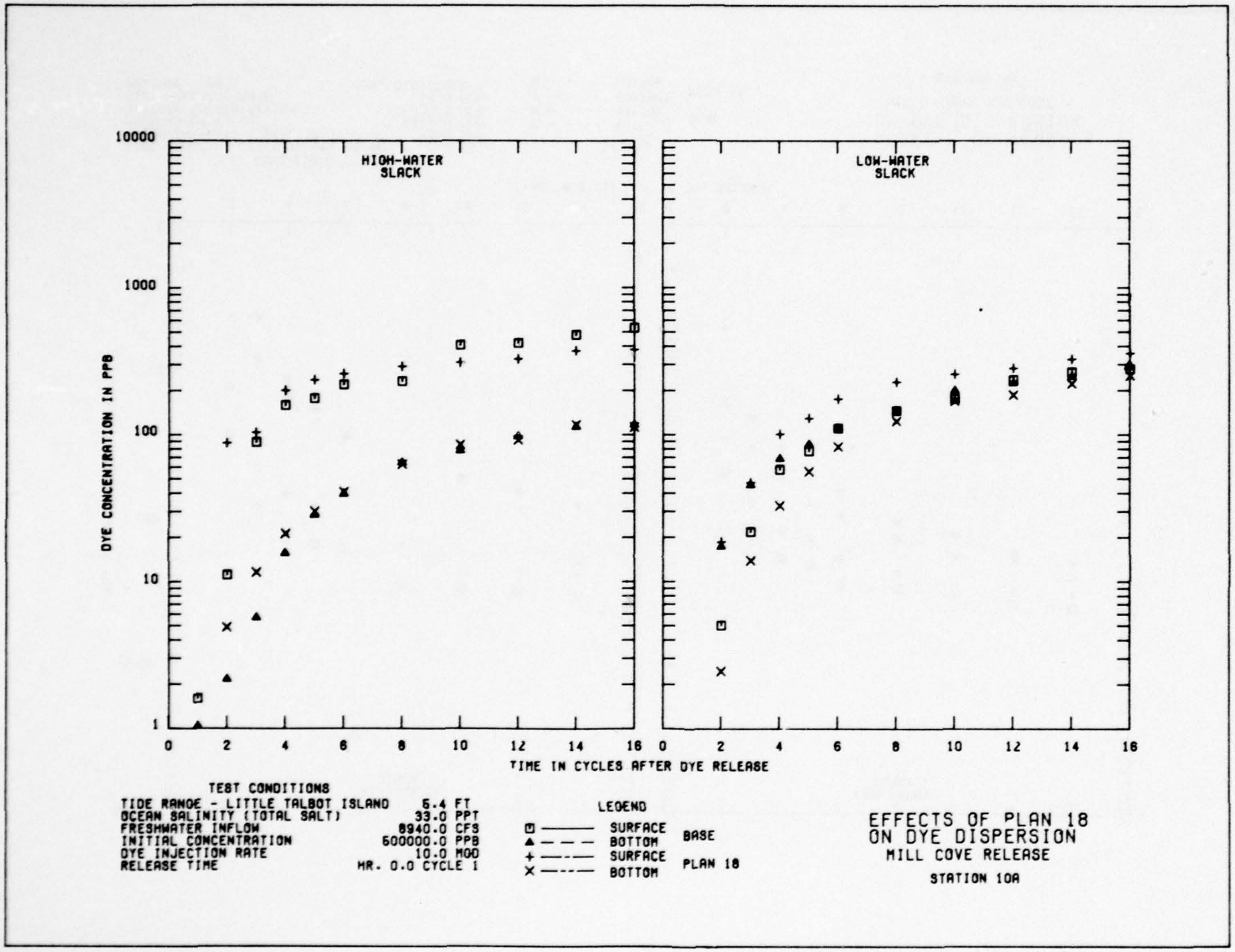

EFFECTS OF PLAN 18
ON DYE DISPERSION
MILL COVE RELEASE
STATION 9AB
HIGH-WATER
SLACK
LOW-WATER
SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
TIME IN CYCLES AFTER DYE RELEASE
0
2
4
6
8
10
12
14
16
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 18

PLATE 94



EFFECTS OF PLAN 18
ON DYE DISPERSION
MILL COVE RELEASE
STATION 98
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
TIME IN CYCLES AFTER DYE RELEASE
0
2
4
6
8
10
12
14
16
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MOD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 18

PLATE 95


HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 18
EFFECTS OF PLAN 18
ON DYE DISPERSION
MILL COVE RELEASE
STATION 10A

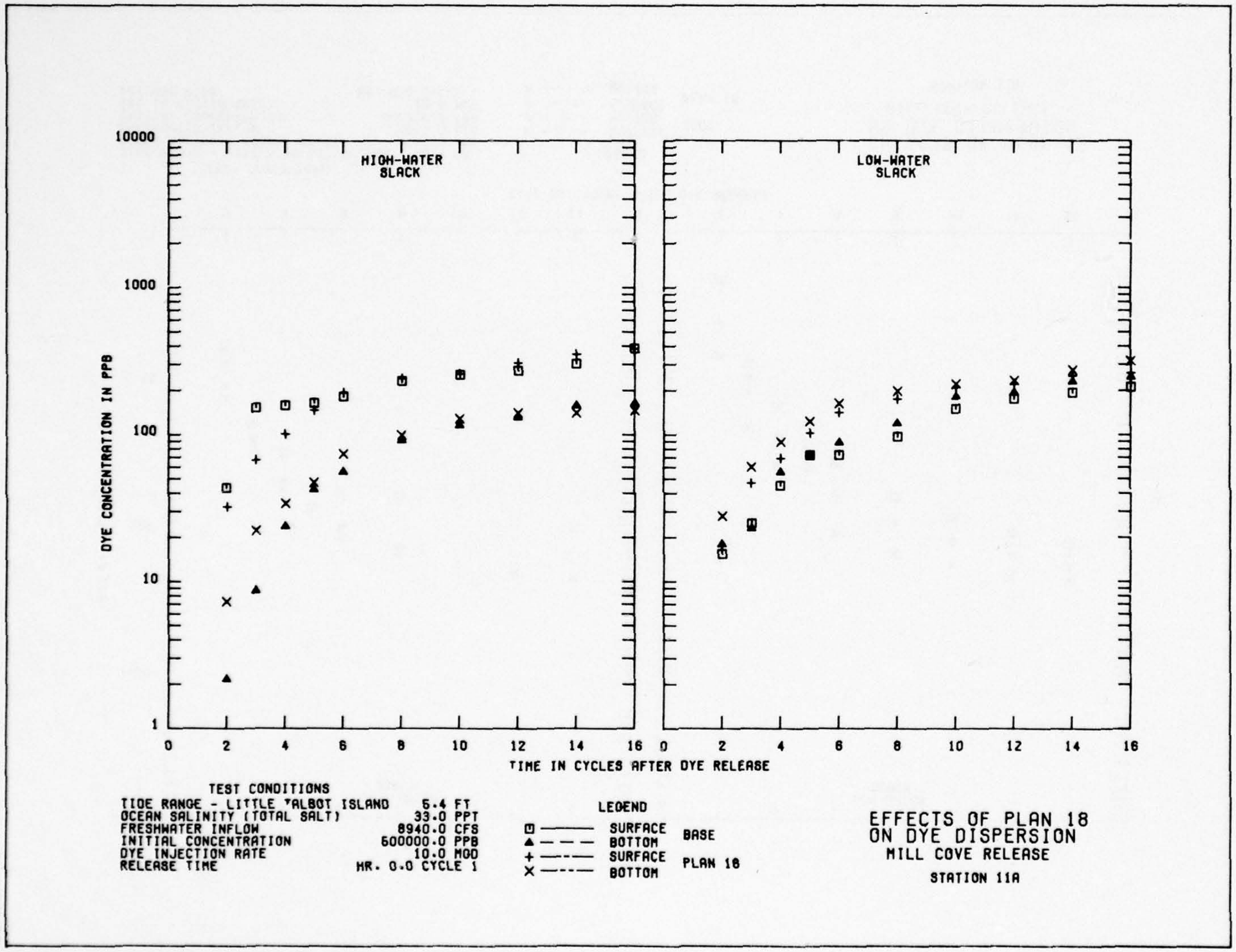

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0 2 4 6 8 10 12 14 16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 10.0 MOD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 18
EFFECTS OF PLAN 18
ON DYE DISPERSION
MILL COVE RELEASE
STATION 11A

PLATE 97

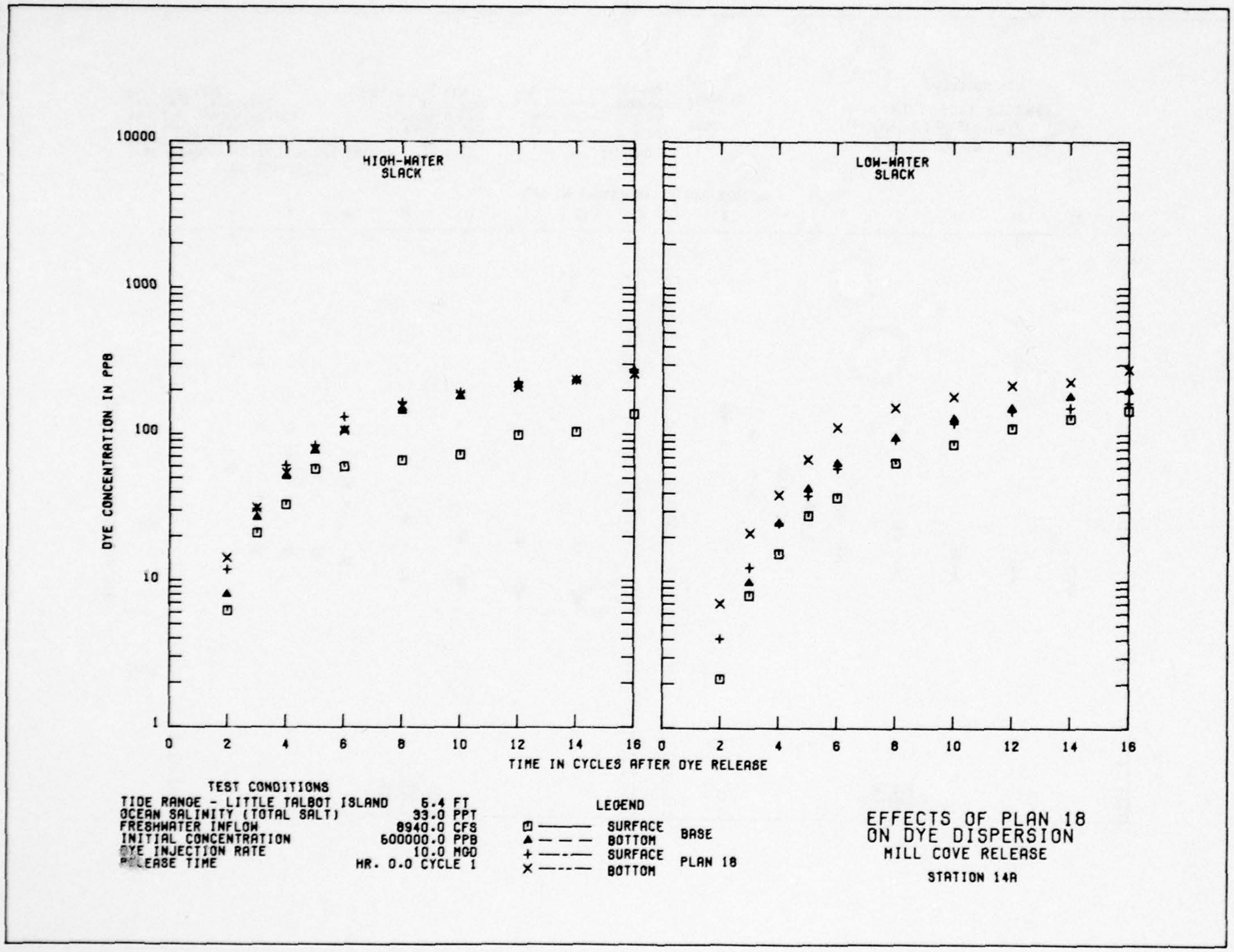

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0 2 4 6 8 10 12 14 16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 18
EFFECTS OF PLAN 18
ON DYE DISPERSION
MILL COVE RELEASE
STATION 14A

PLATE 98

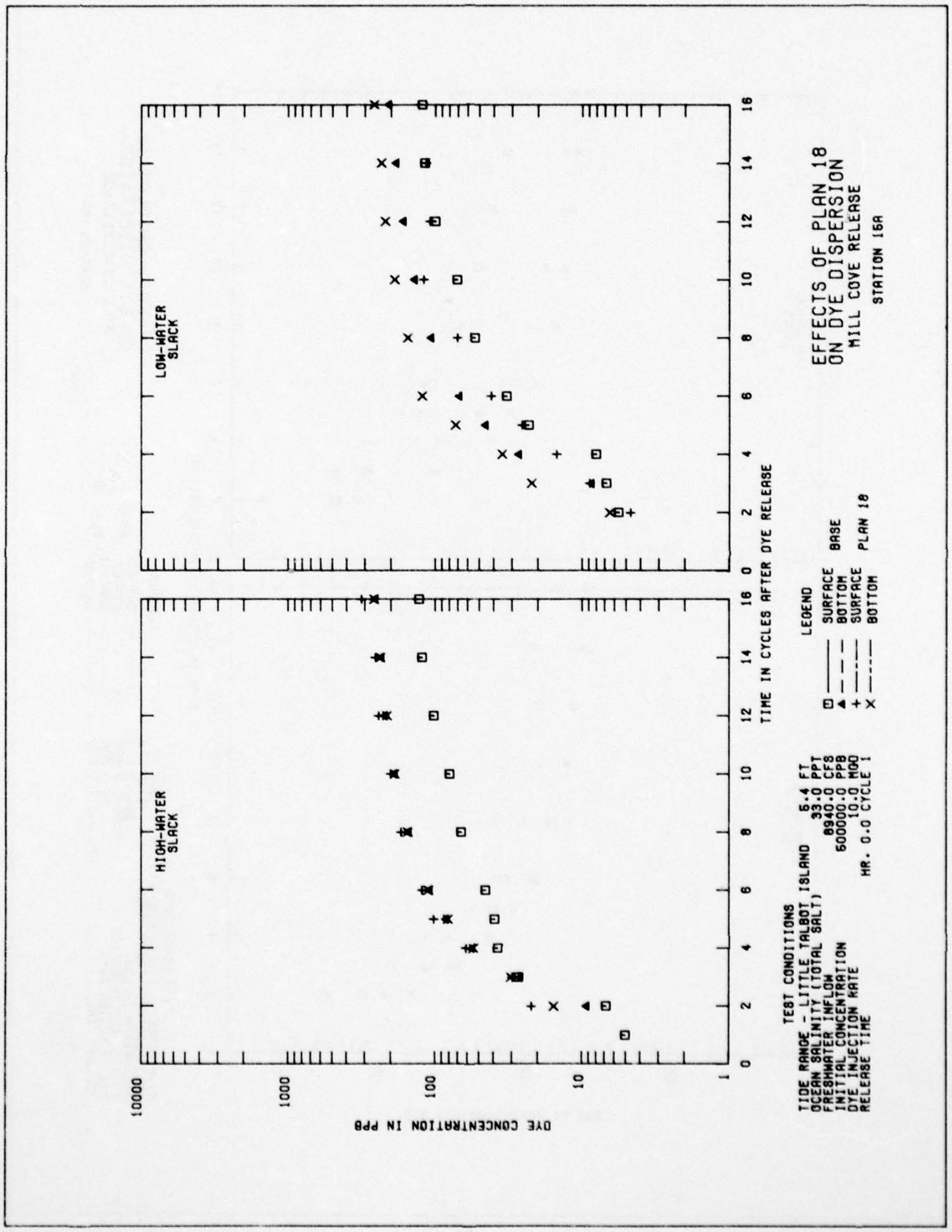
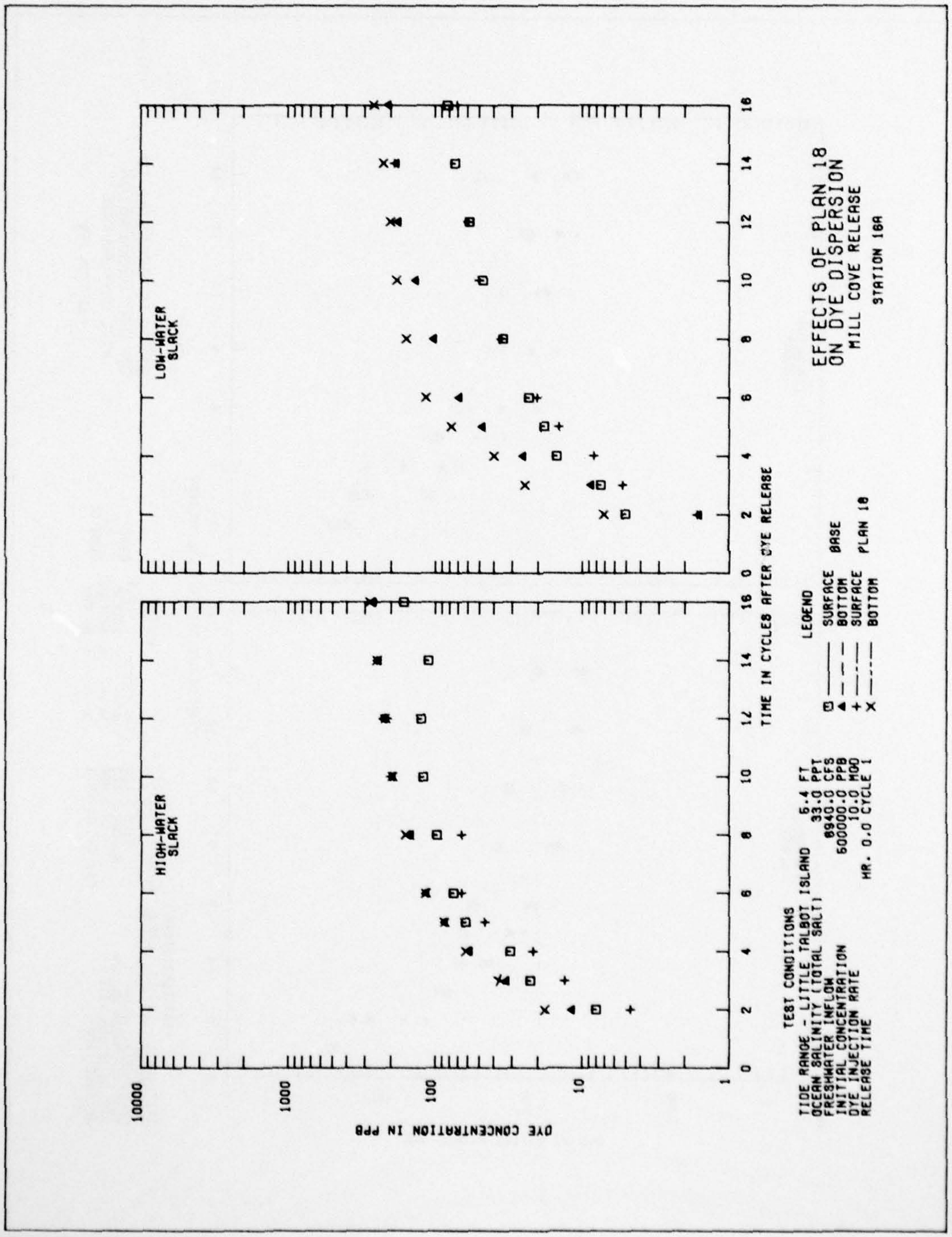
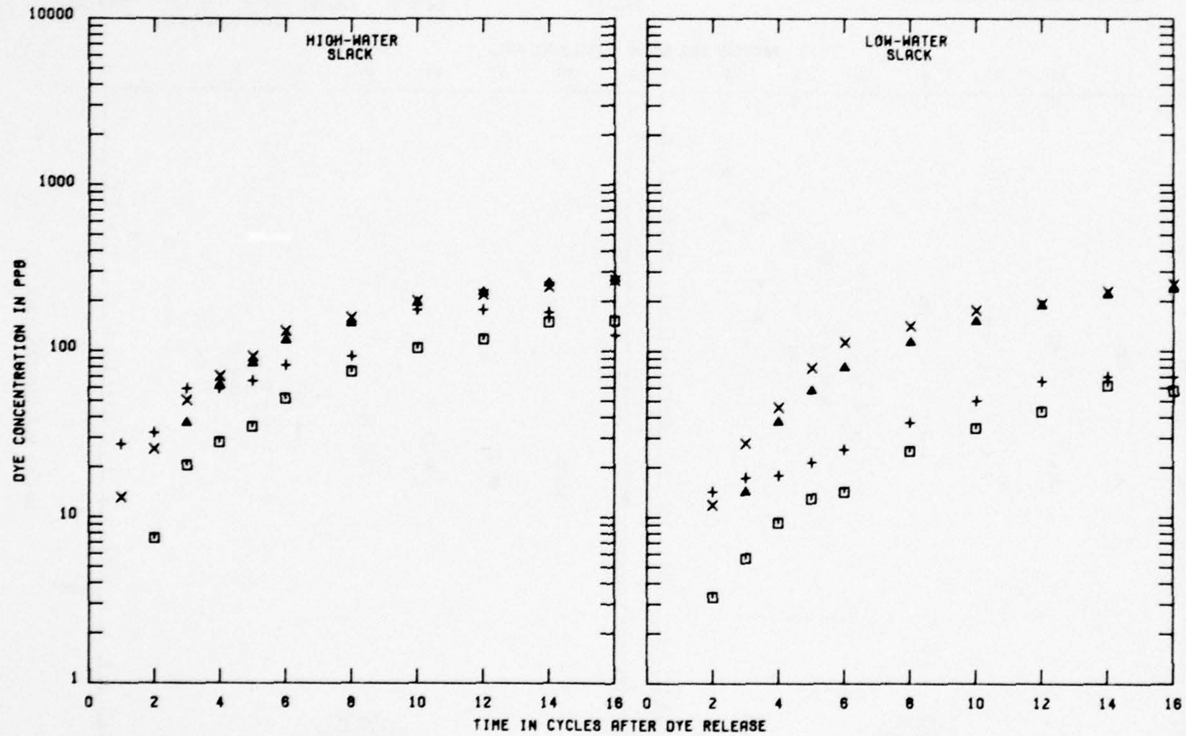

EFFECTS OF PLAN 18
ON DYE DISPERSION
MILL COVE RELEASE
STATION 15A
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
TIME IN CYCLES AFTER DYE RELEASE
0 2 4 6 8 10 12 14 16
LEGEND
SURFACE BASE
BOTTOM BASE
SURFACE PLAN 18
BOTTOM PLAN 18
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1

PLATE 99


HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 6940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 18
EFFECTS OF PLAN 18
ON DYE DISPERSION
MILL COVE RELEASE
STATION 18A



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	6.4	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8940.0	CFS
INITIAL CONCENTRATION	600000.0	PPB
DYE INJECTION RATE	10.0	MOD
RELEASE TIME	HR. 0.0	CYCLE 1

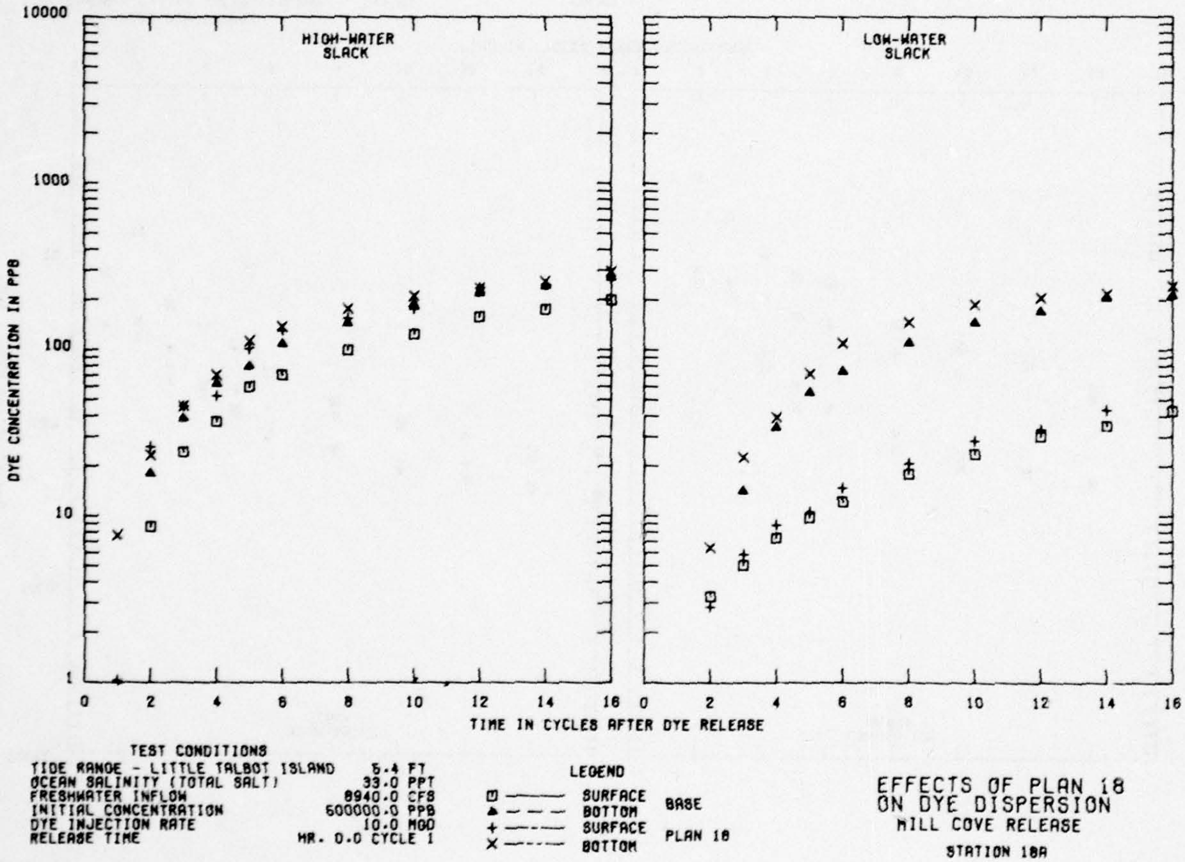
LEGEND

⊡ ———	SURFACE	BASE
▲ — — —	BOTTOM	
+ —·—·—	SURFACE	PLAN 18
× —··—··—	BOTTOM	

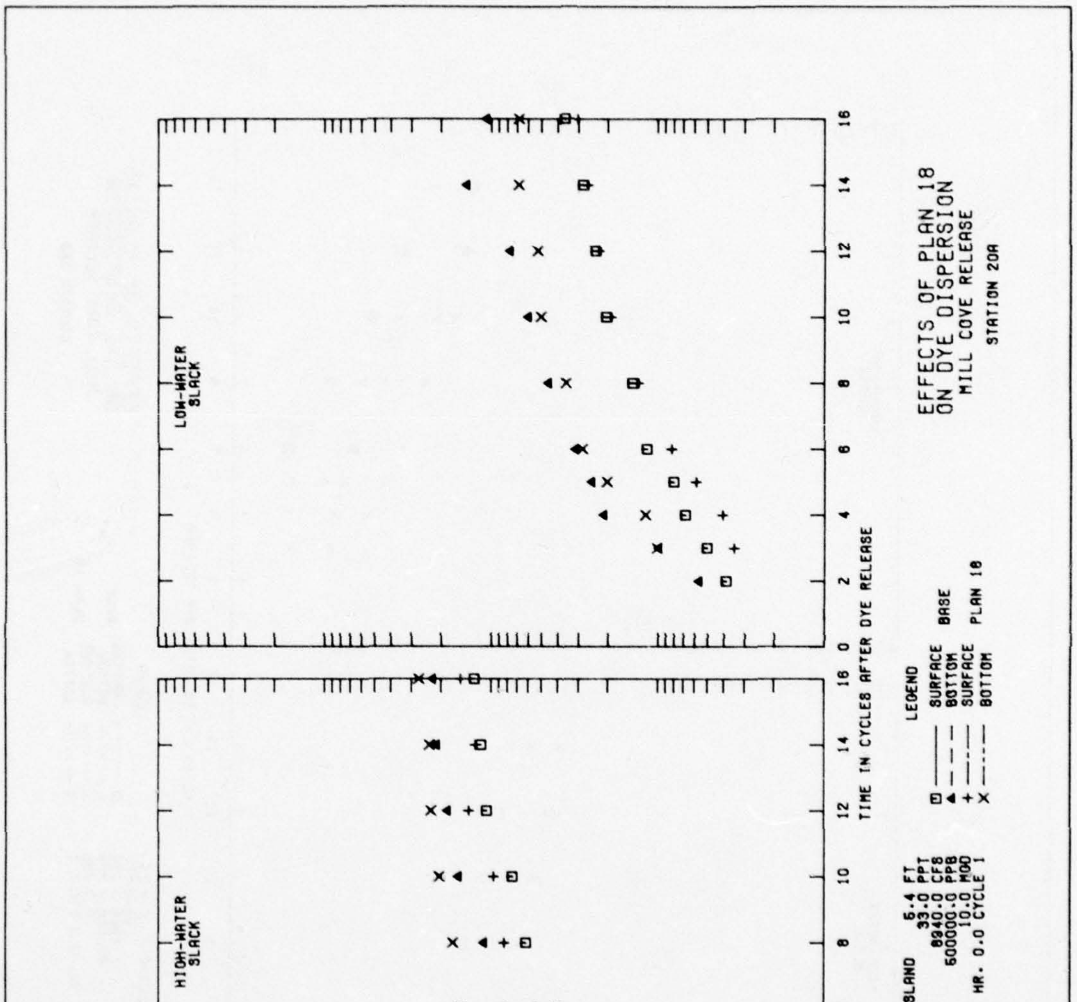
EFFECTS OF PLAN 18
ON DYE DISPERSION
MILL COVE RELEASE

STATION 17A

PLATE 102

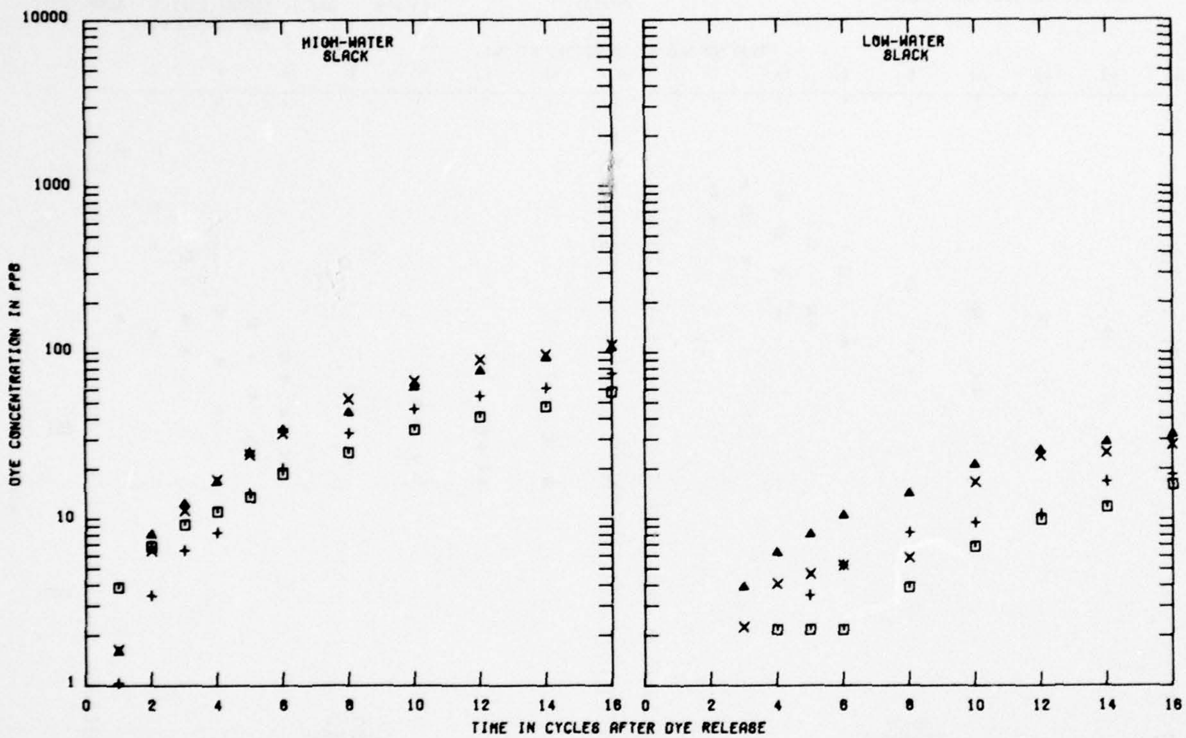


HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0 2 4 6 8 10 12 14 16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 18
EFFECTS OF PLAN 18
ON DYE DISPERSION
MILL COVE RELEASE
STATION 18A



HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8340.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 18
EFFECTS OF PLAN 18
ON DYE DISPERSION
MILL COVE RELEASE
STATION 20A

PLATE 103



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	10.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

⊡ ———	SURFACE	BASE
▲ — — —	BOTTOM	
+ —·—·—	SURFACE	PLAN 18
× —··—··	BOTTOM	

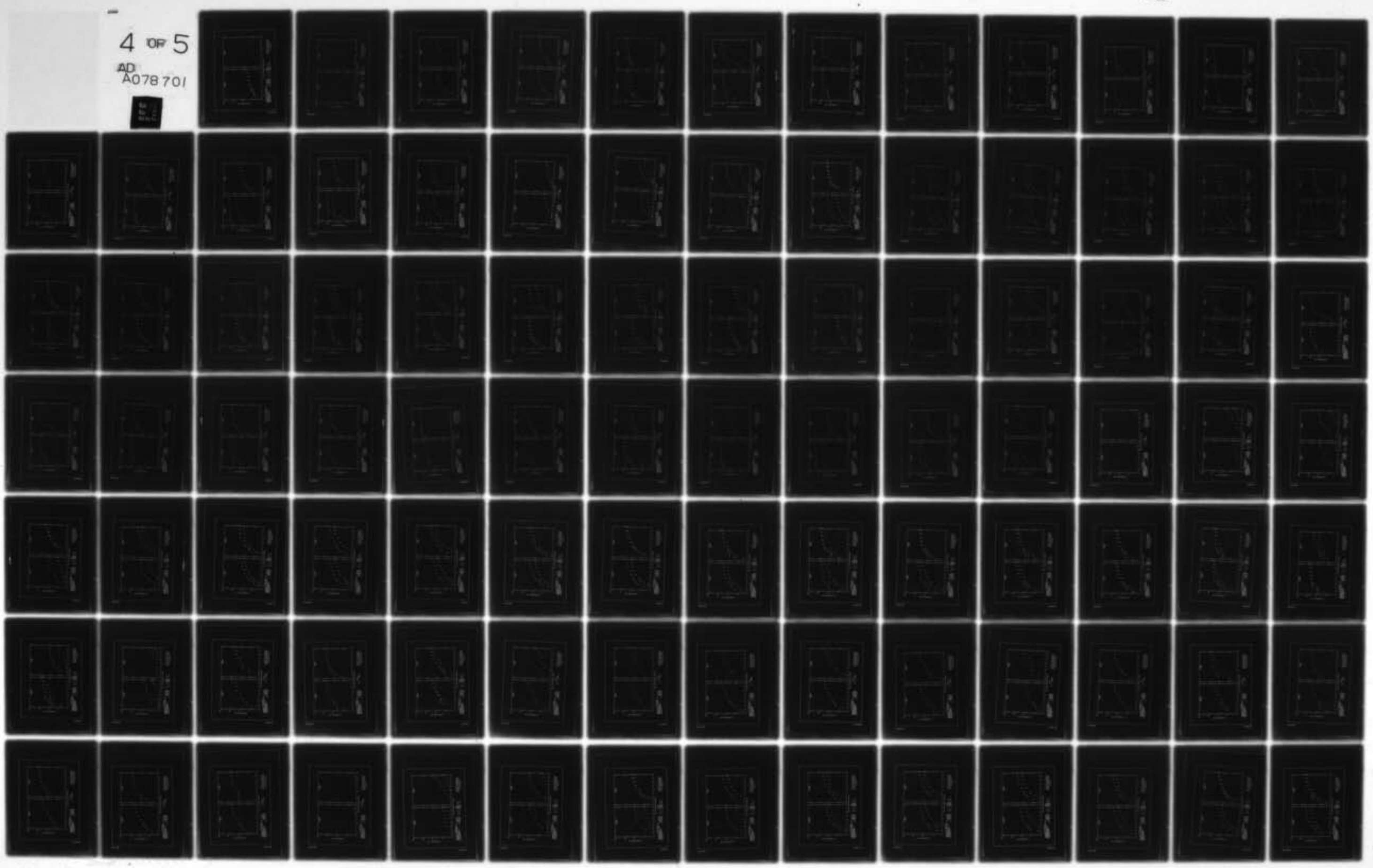
EFFECTS OF PLAN 18
ON DYE DISPERSION
MILL COVE RELEASE

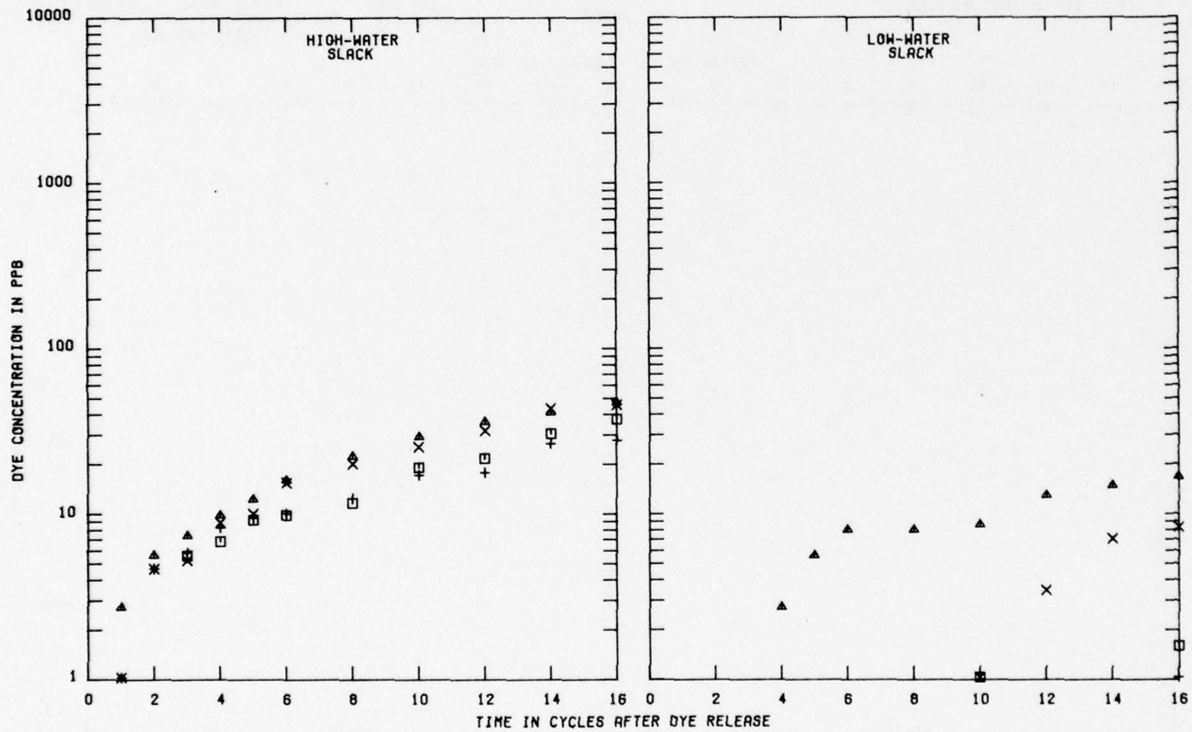
STATION 24A

AD-A078 701 ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG--ETC F/G 8/8
MAYPORT-MILL COVE MODEL STUDY. REPORT 3. MILL COVE STUDY. HYDRA--ETC(U)
SEP 79 N J BROGDON, J W PARMAN

UNCLASSIFIED WES/HL-79-12-3 NL

4 OF 5
AD A078701





TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	10.0 MOD
RELEASE TIME	HR. 0.0 CYCLE 1

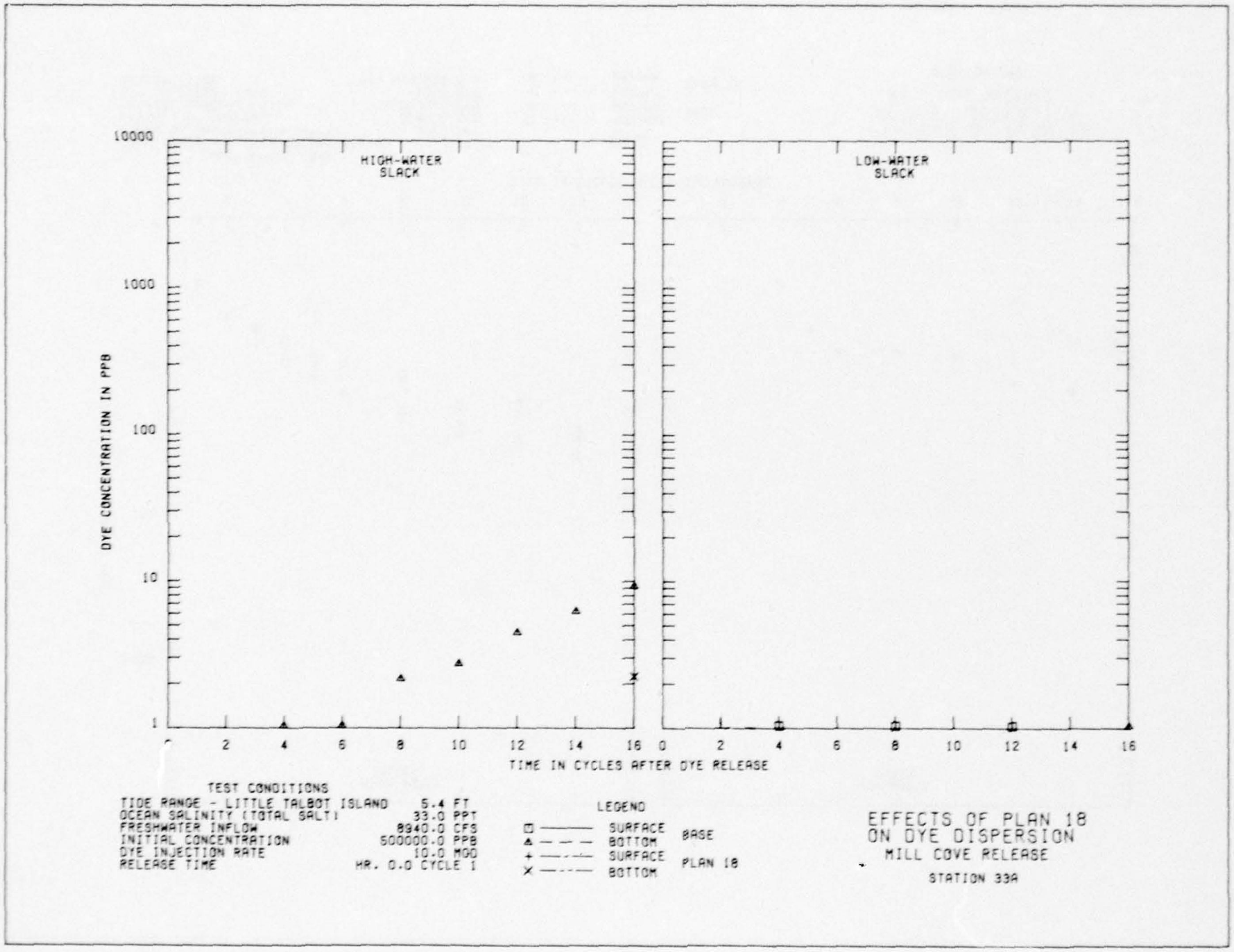
LEGEND

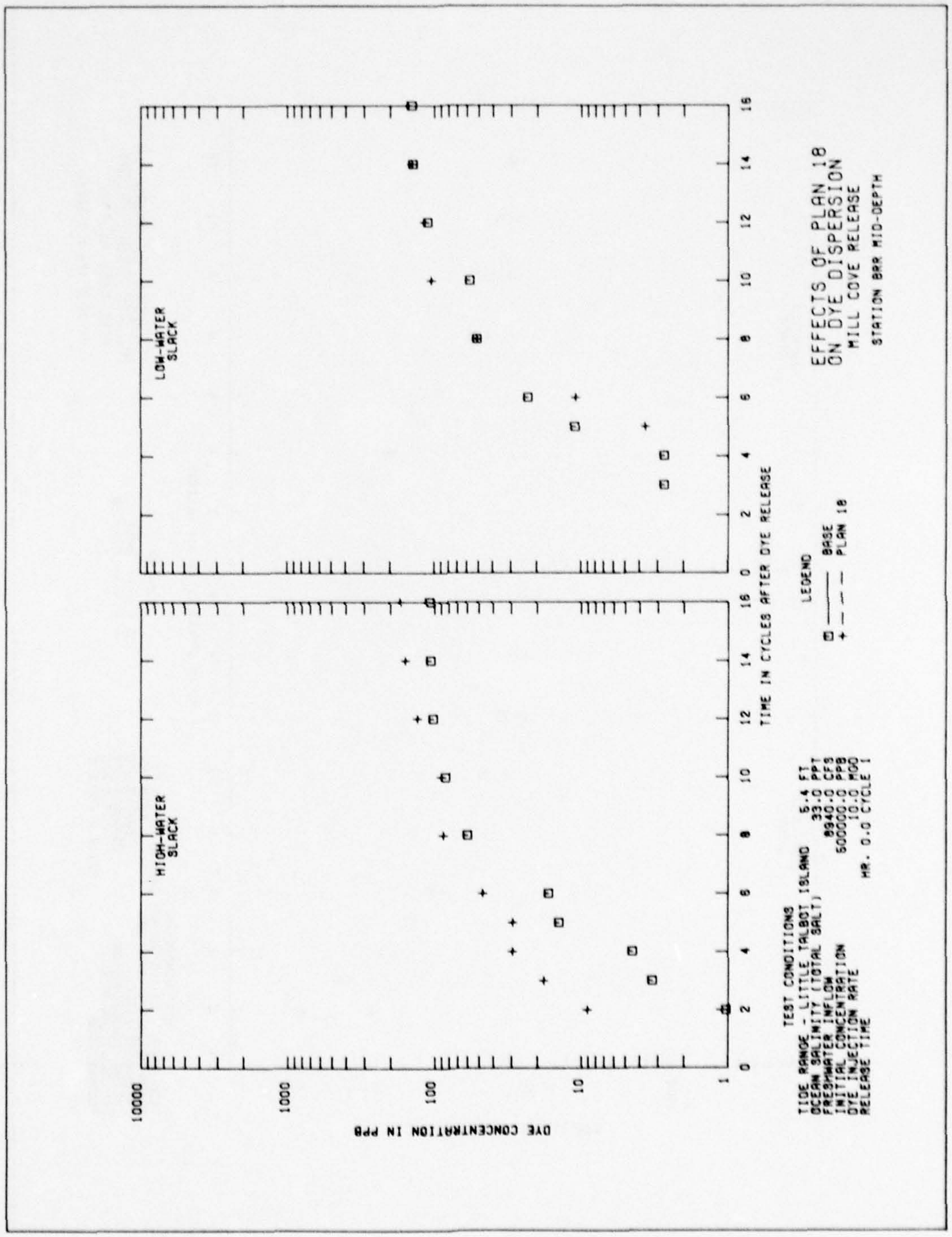
Symbol		
⊡ ———	SURFACE	BASE
▲ — — —	BOTTOM	BASE
+ —·—·—	SURFACE	PLAN 18
× —··—··	BOTTOM	PLAN 18

EFFECTS OF PLAN 18
ON DYE DISPERSION
MILL COVE RELEASE

STATION 28B

PLATE 106


HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 18
EFFECTS OF PLAN 18
ON DYE DISPERSION
MILL COVE RELEASE
STATION 33A



EFFECTS OF PLAN 18
ON DYE DISPERSION
MILL COVE RELEASE
STATION B9R MID-DEPTH
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
TIME IN CYCLES AFTER DYE RELEASE
LEGEND
BASE
PLAN 18
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1

PLATE 107

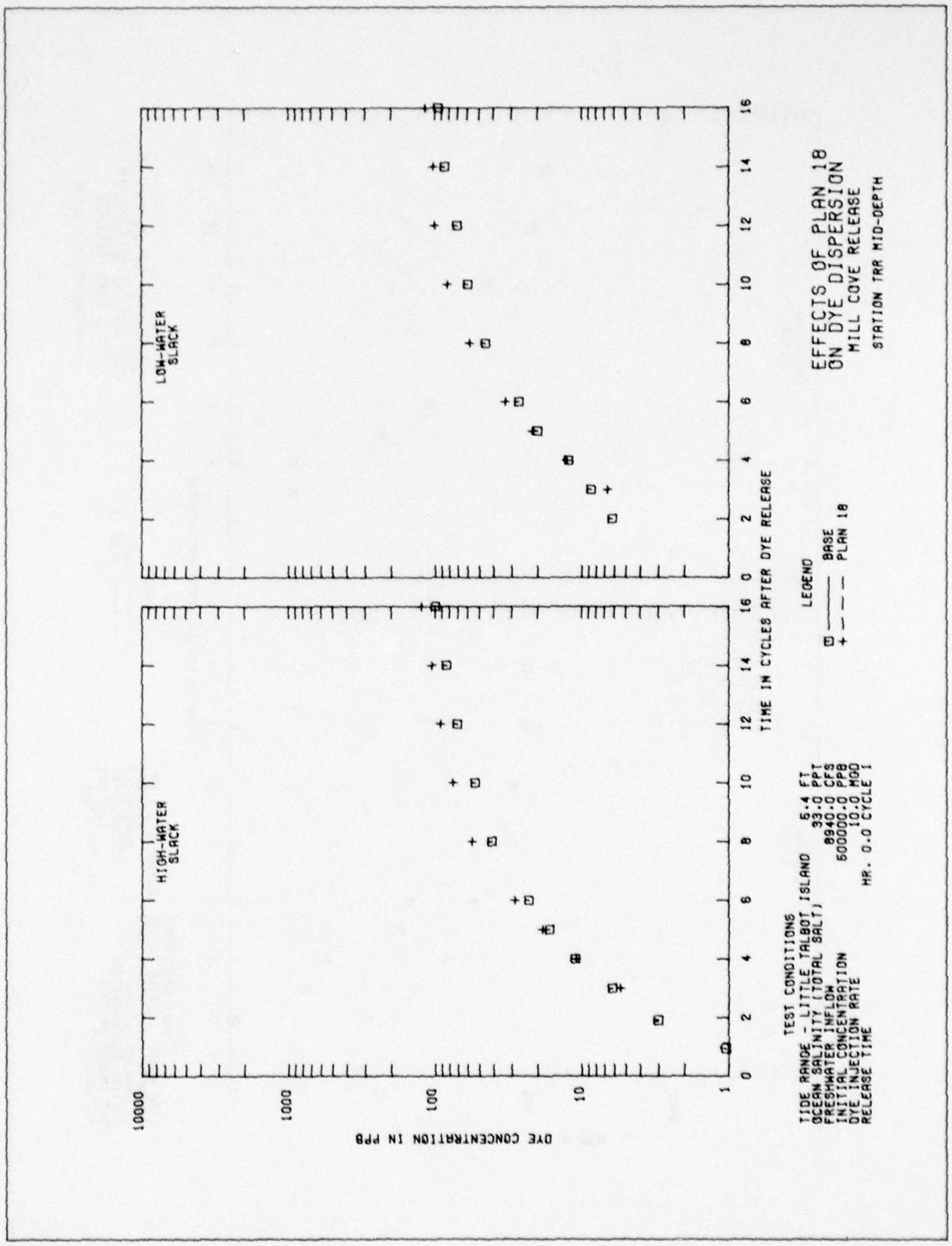
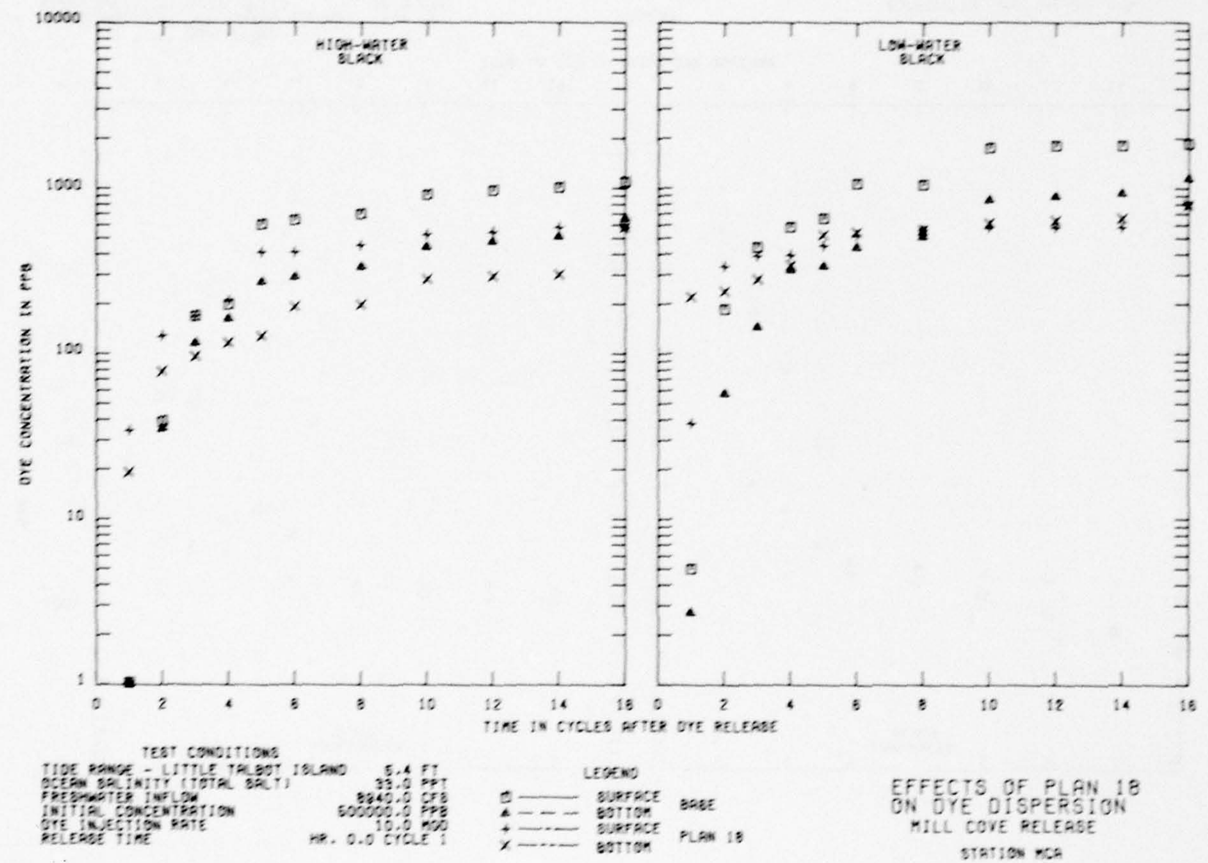

EFFECTS OF PLAN 18
ON DYE DISPERSION
MILL COVE RELEASE
STATION TRR MID-DEPTH
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
LEGEND
BASE
PLAN 18
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 6.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1

PLATE 108


HIGH-WATER BLACK
LOW-WATER BLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0 2 4 6 8 10 12 14 16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8840.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 1B
EFFECTS OF PLAN 1B
ON DYE DISPERSION
MILL COVE RELEASE
STATION MCA

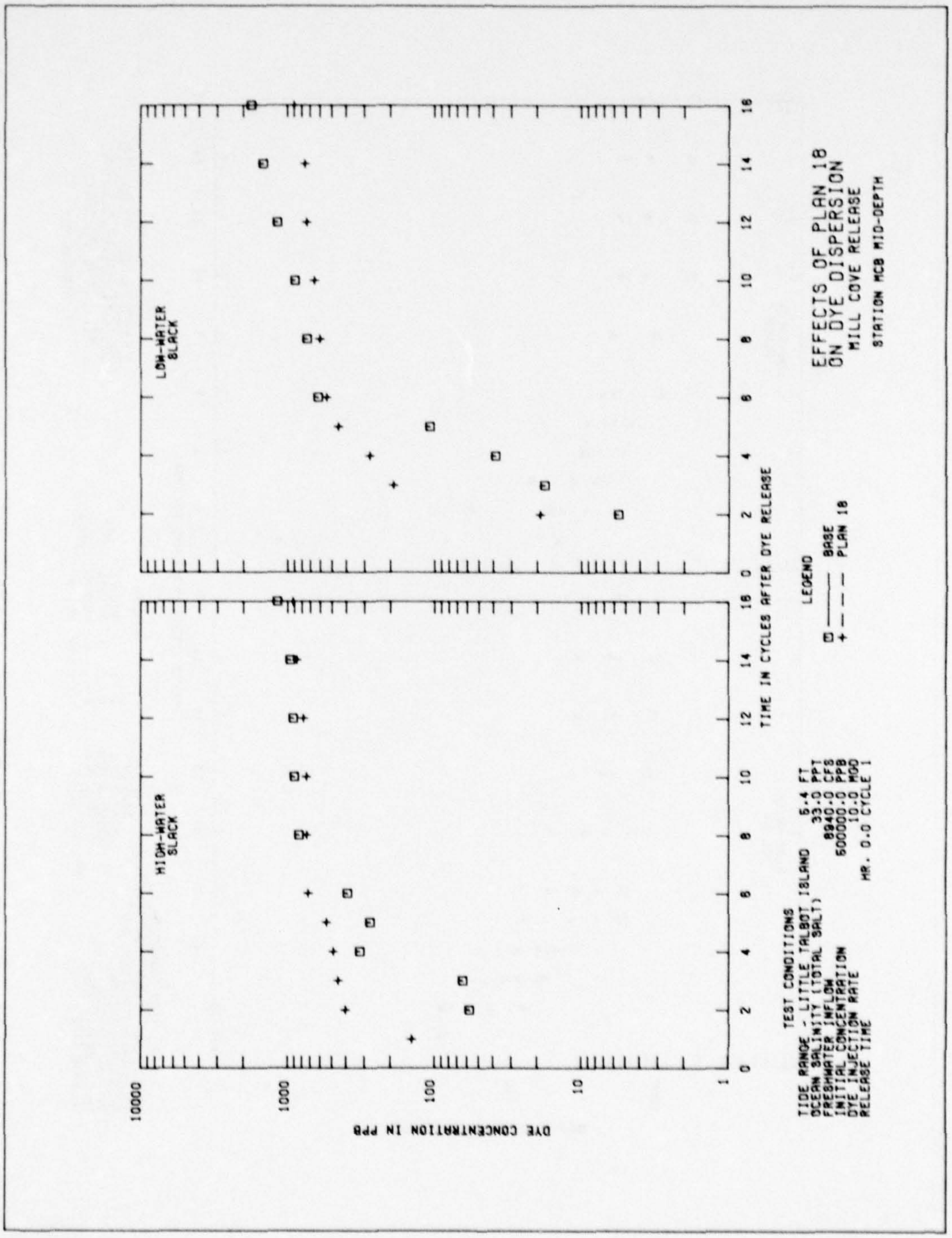
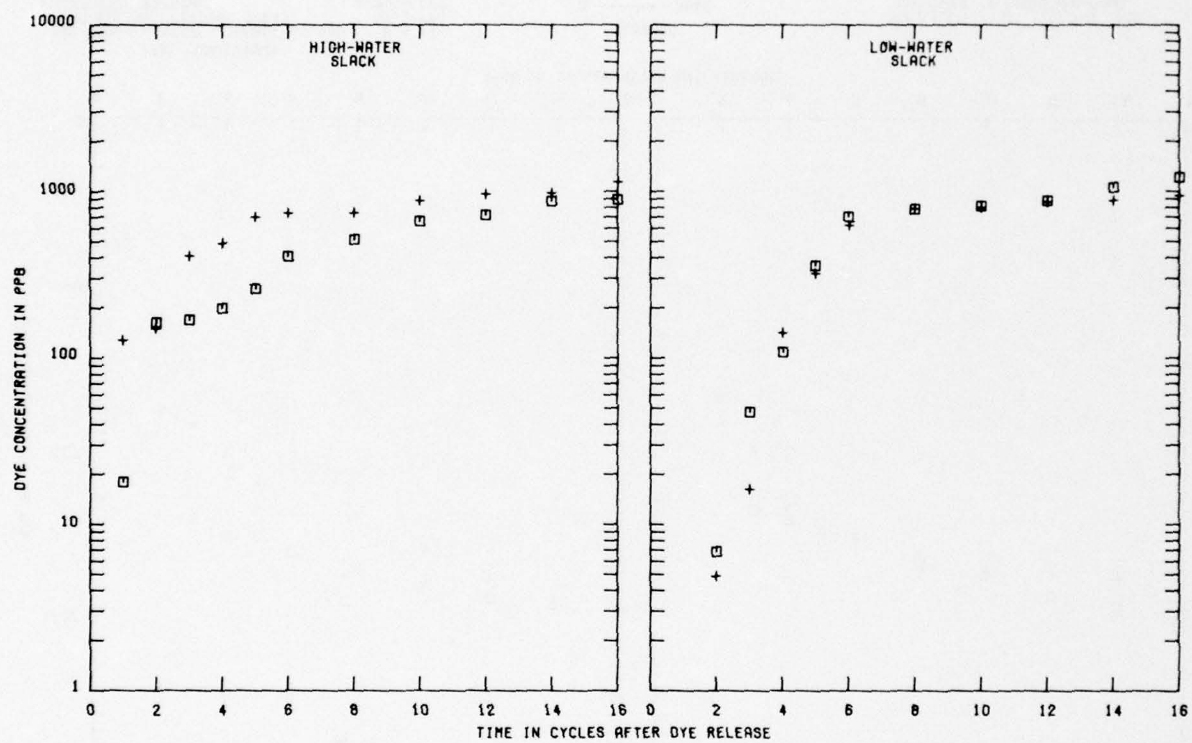

EFFECTS OF PLAN 18
ON DYE DISPERSION
MILL COVE RELEASE
STATION MCB MID-DEPTH
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
TIME IN CYCLES AFTER DYE RELEASE
LEGEND
BASE
PLAN 18
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1

PLATE 110



TEST CONDITIONS

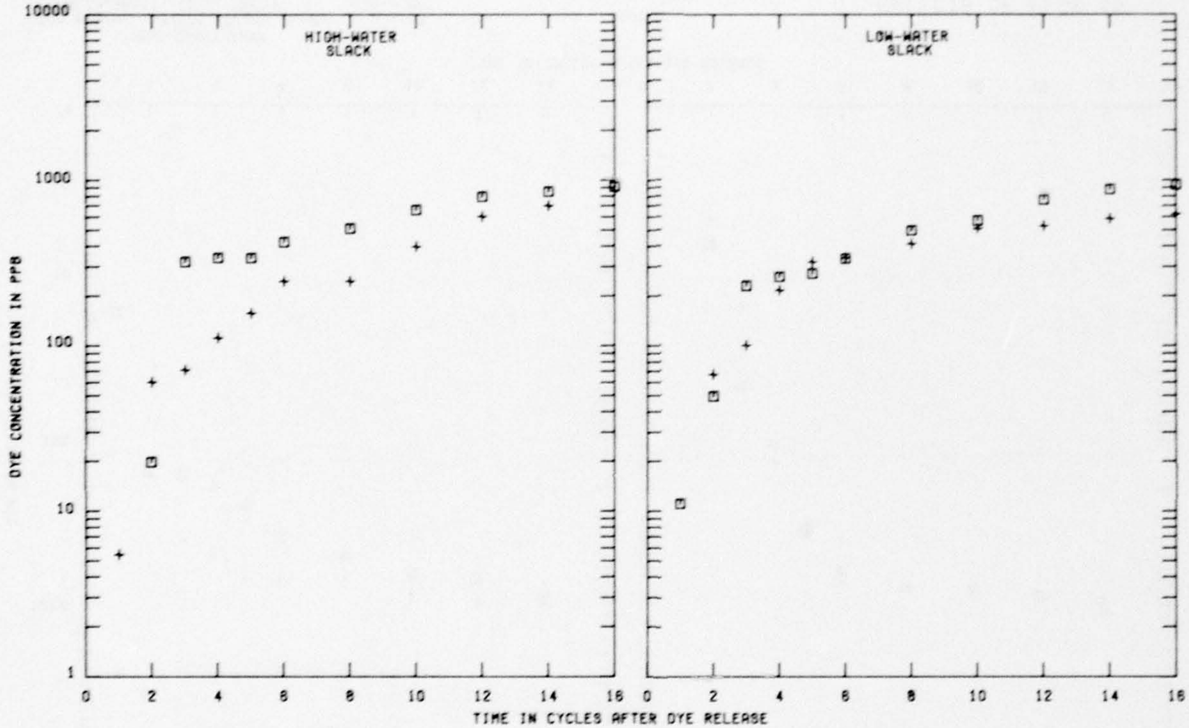
TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	10.0 MOD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

BASE

PLAN 18

EFFECTS OF PLAN 18
ON DYE DISPERSION
MILL COVE RELEASE
STATION MCC MID-DEPTH



TEST CONDITIONS

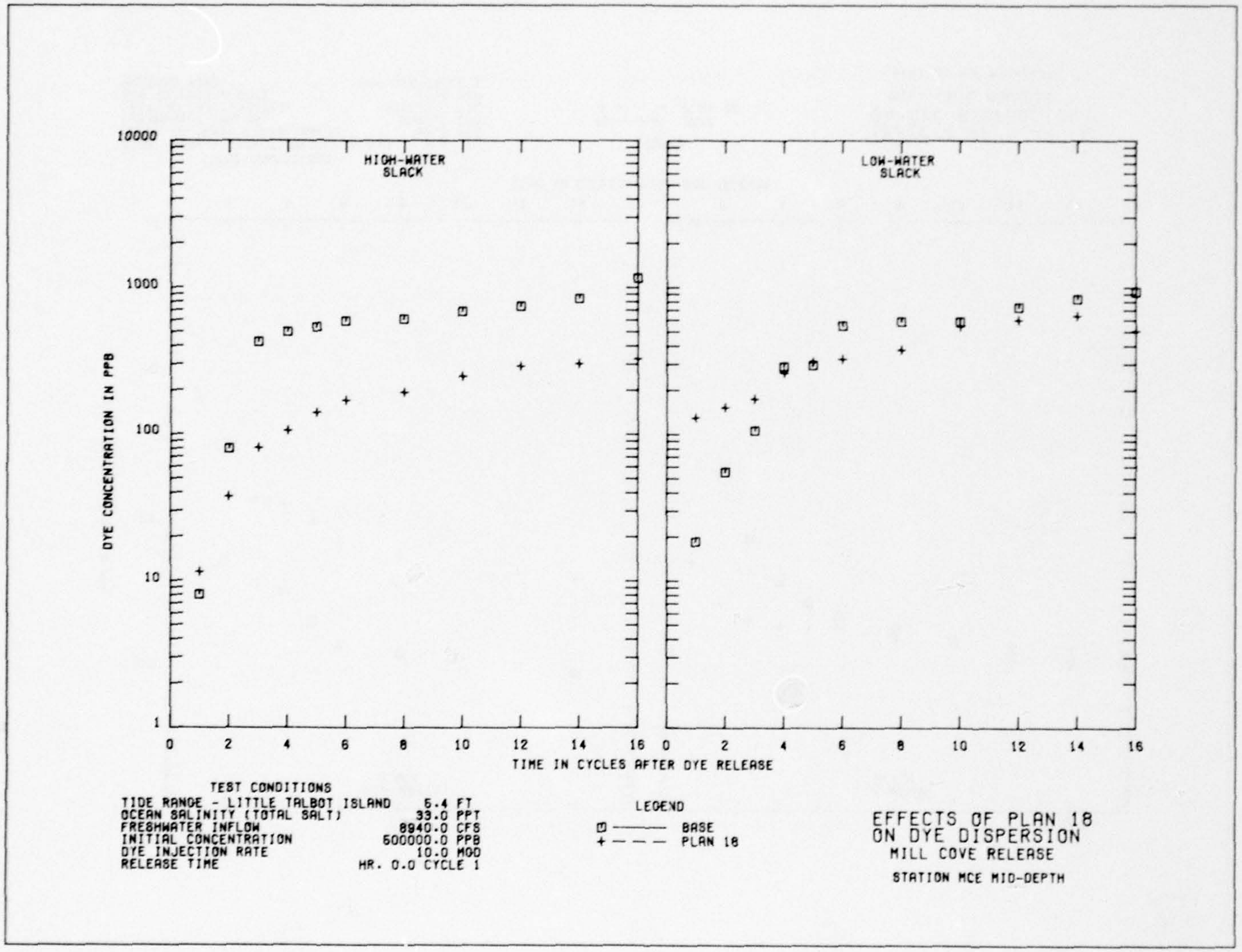
TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	10.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

⊡ ——— BASE
\+ — — — PLAN 18

EFFECTS OF PLAN 18
ON DYE DISPERSION
MILL COVE RELEASE

STATION MCD MID-DEPTH


HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0 2 4 6 8 10 12 14 16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
BASE
PLAN 18
EFFECTS OF PLAN 18
ON DYE DISPERSION
MILL COVE RELEASE
STATION MCE MID-DEPTH

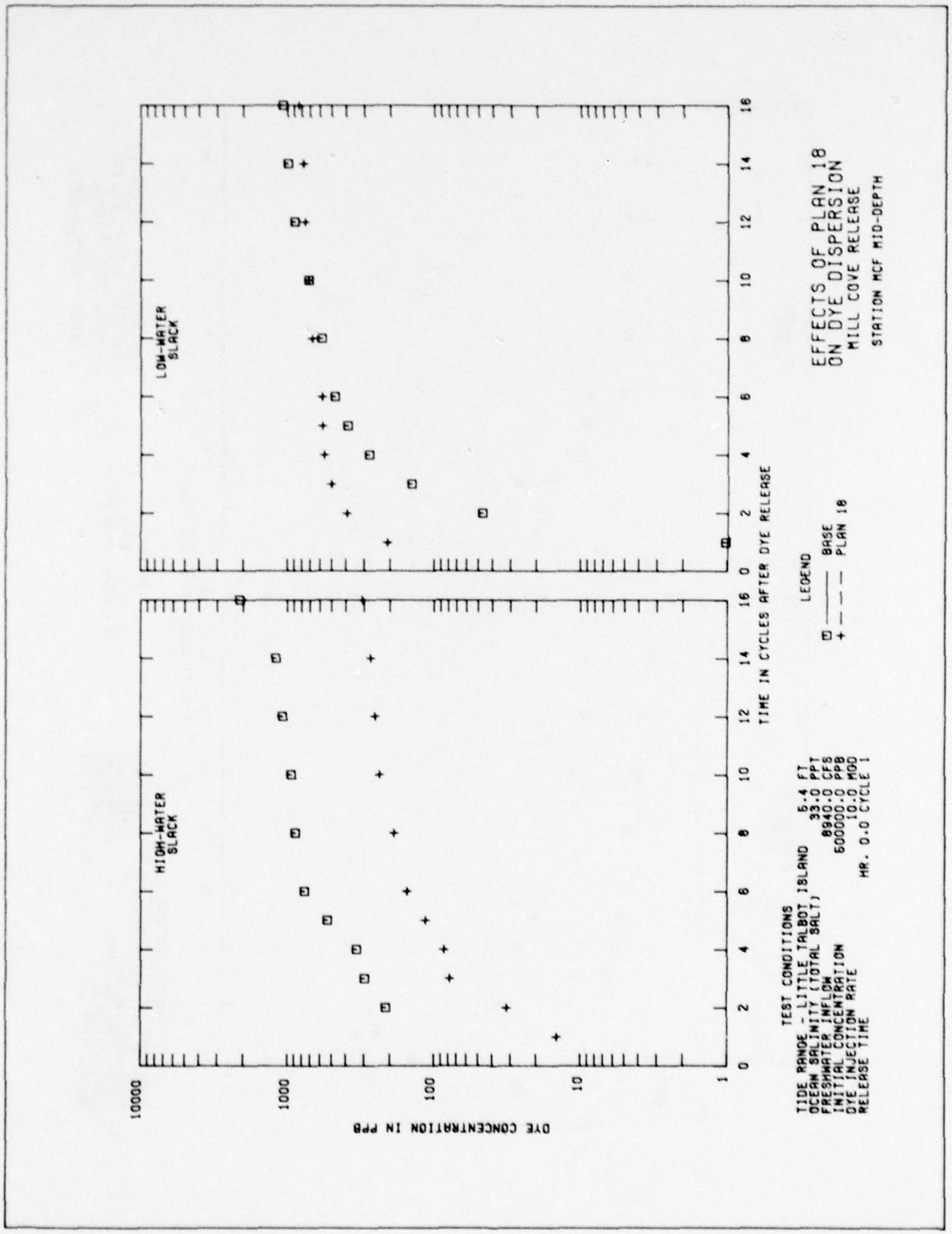
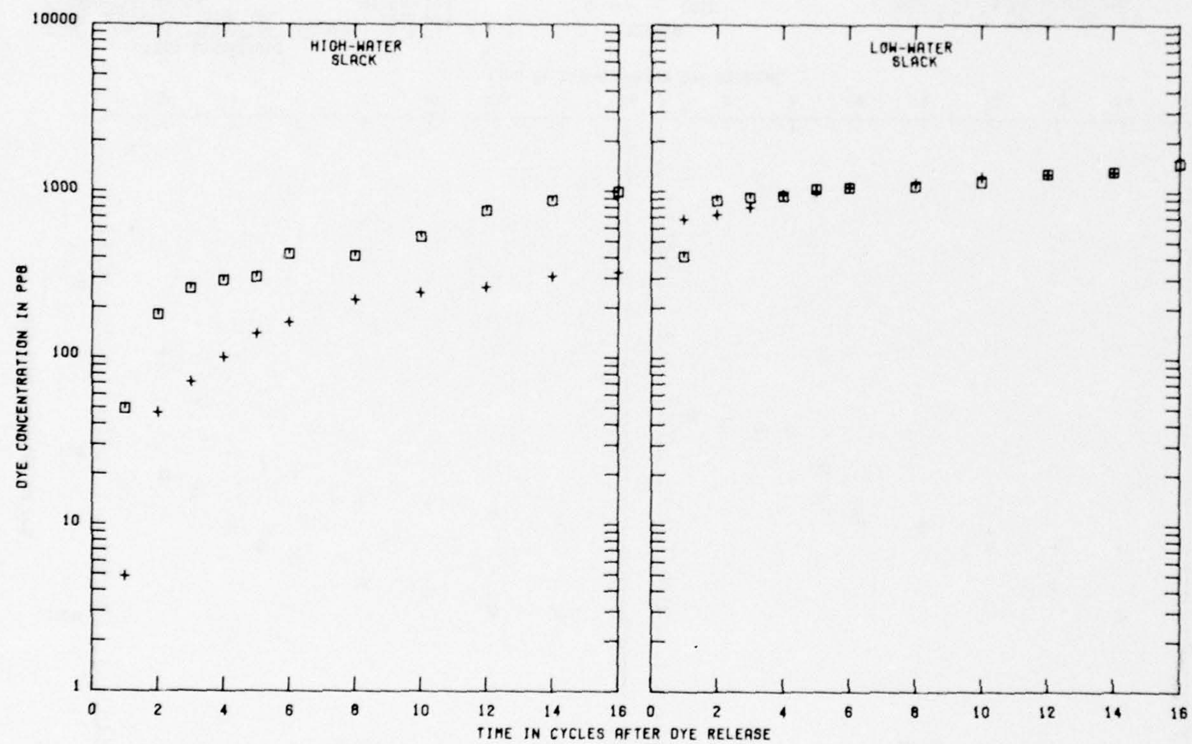

EFFECTS OF PLAN 18
ON DYE DISPERSION
MILL COVE RELEASE
STATION MCF MID-DEPTH
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
TIME IN CYCLES AFTER DYE RELEASE
LEGEND
BASE
PLAN 18
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1

PLATE 114



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	6.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	10.0 MOD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

⊡ ——— BASE
+ — — — PLAN 18

EFFECTS OF PLAN 18
ON DYE DISPERSION
MILL COVE RELEASE

STATION MCG MID-DEPTH

PLATE 115

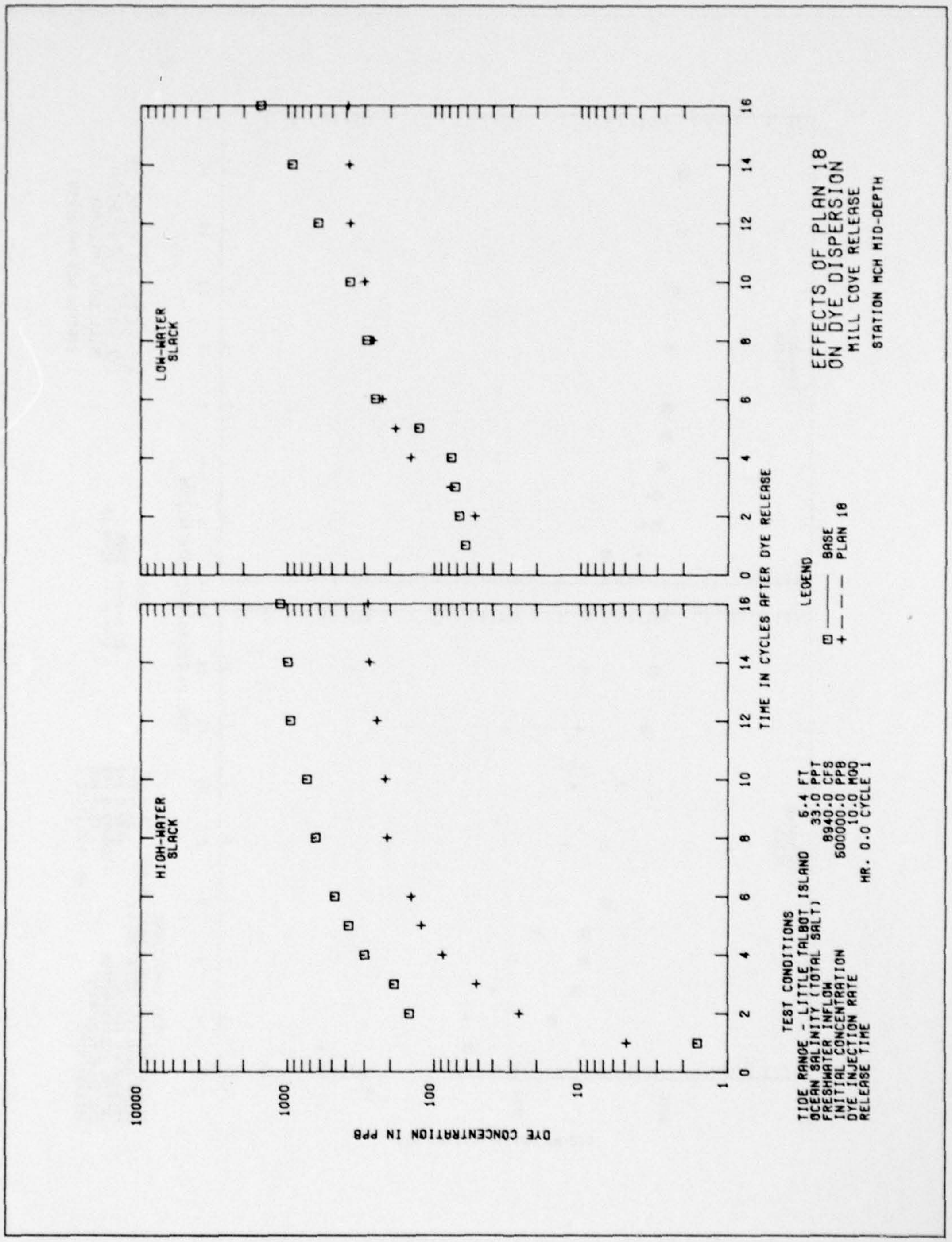
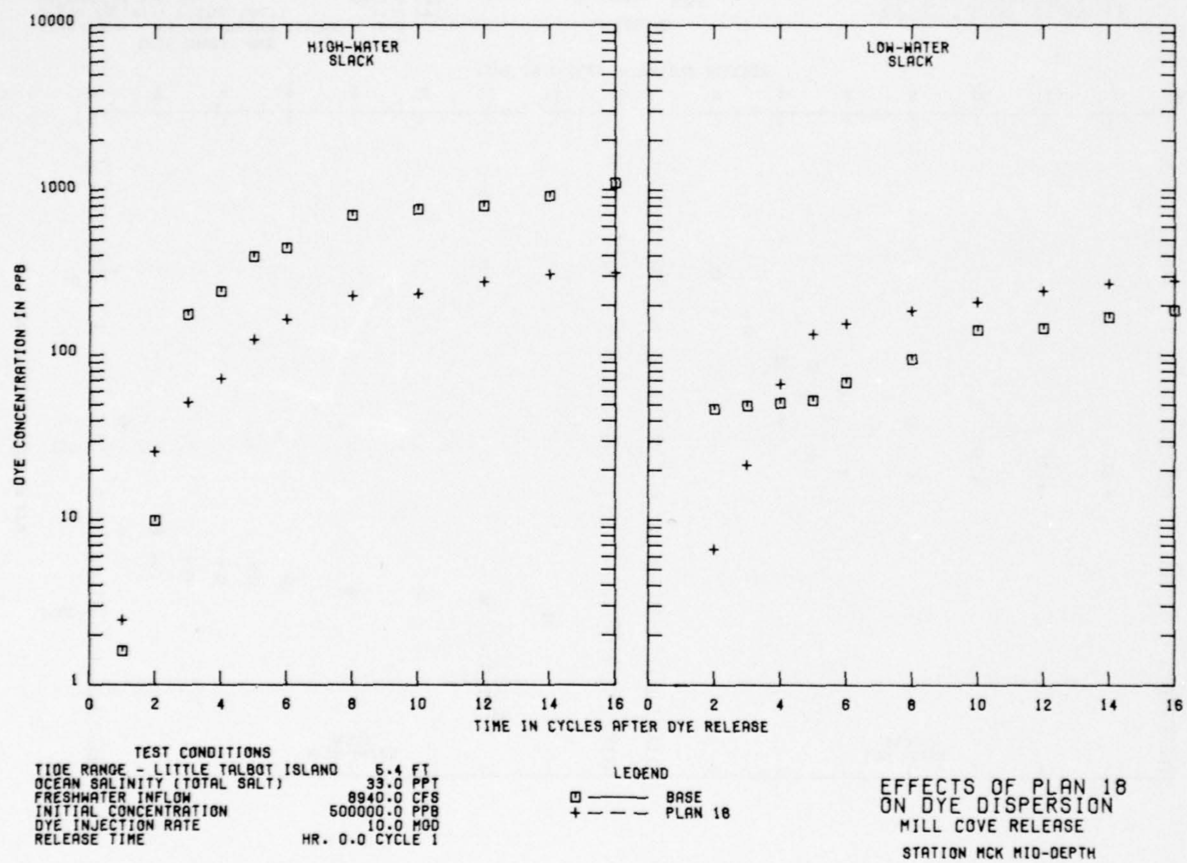
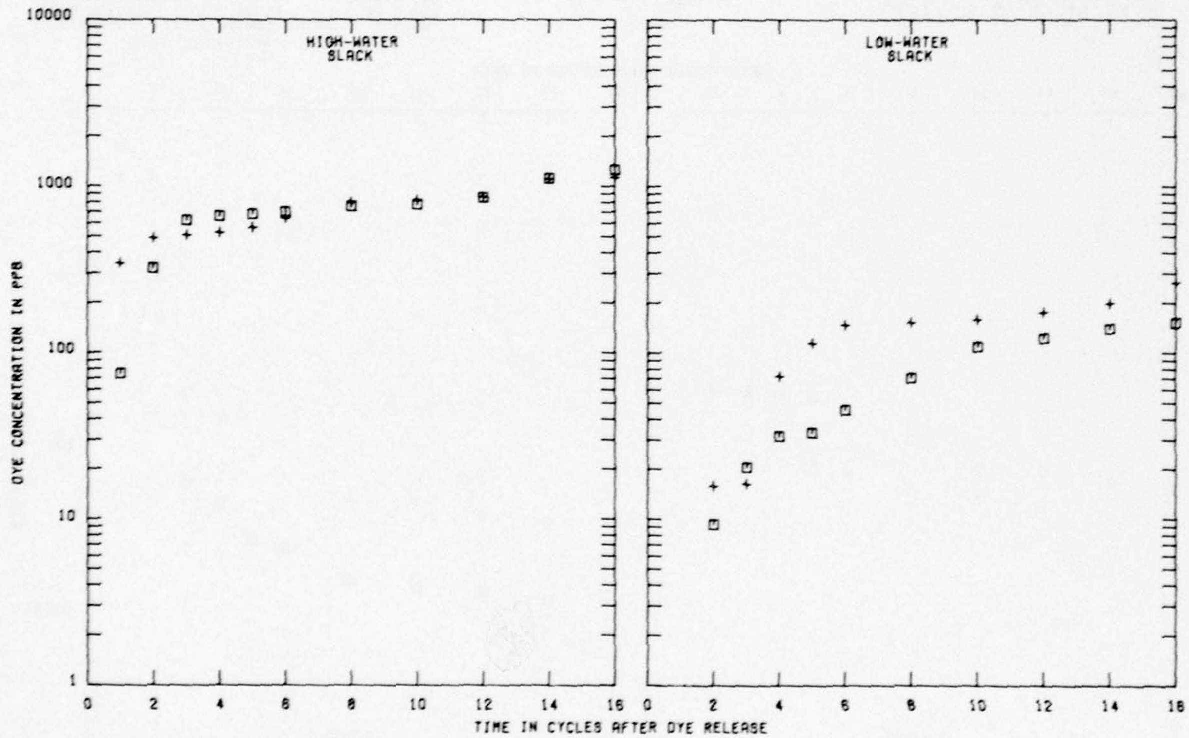

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
BASE
PLAN 18
EFFECTS OF PLAN 18
ON DYE DISPERSION
MILL COVE RELEASE
STATION MCH MID-DEPTH

PLATE 116



EFFECTS OF PLAN 18
ON DYE DISPERSION
MILL COVE RELEASE
STATION MCK MID-DEPTH
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
TIME IN CYCLES AFTER DYE RELEASE
0
2
4
6
8
10
12
14
16
LEGEND
BASE
PLAN 18
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1



TEST CONDITIONS

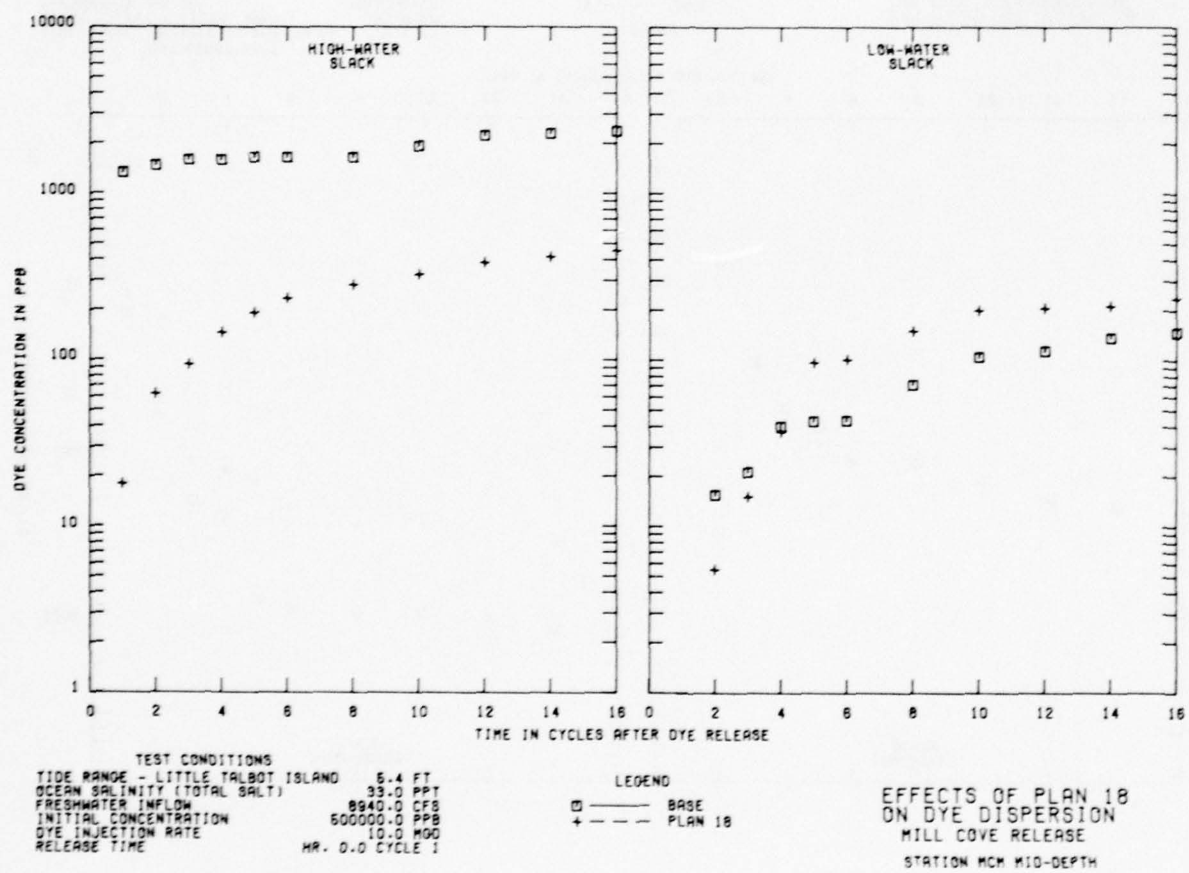
TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	600000.0 PPB
DYE INJECTION RATE	10.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

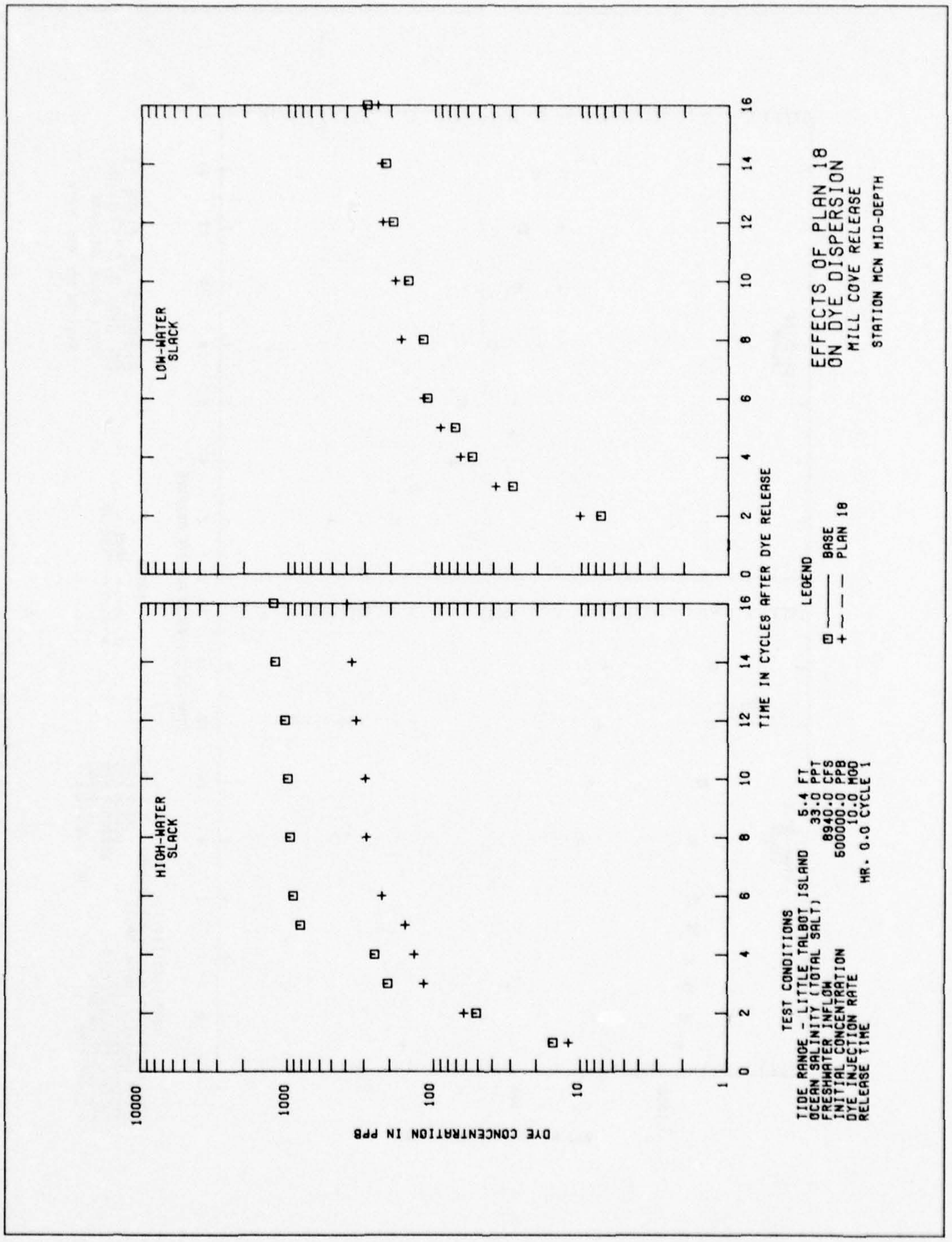
LEGEND

⊡ ——— BASE
\+ — — — PLAN 18

EFFECTS OF PLAN 18
ON DYE DISPERSION
MILL COVE RELEASE

STATION MCL MID-DEPTH


HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
BASE
PLAN 18
EFFECTS OF PLAN 18
ON DYE DISPERSION
MILL COVE RELEASE
STATION MCM MID-DEPTH



HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 10.0 MOD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
BASE
PLAN 18
EFFECTS OF PLAN 18
ON DYE DISPERSION
MILL COVE RELEASE
STATION MCN MID-DEPTH

PLATE 120

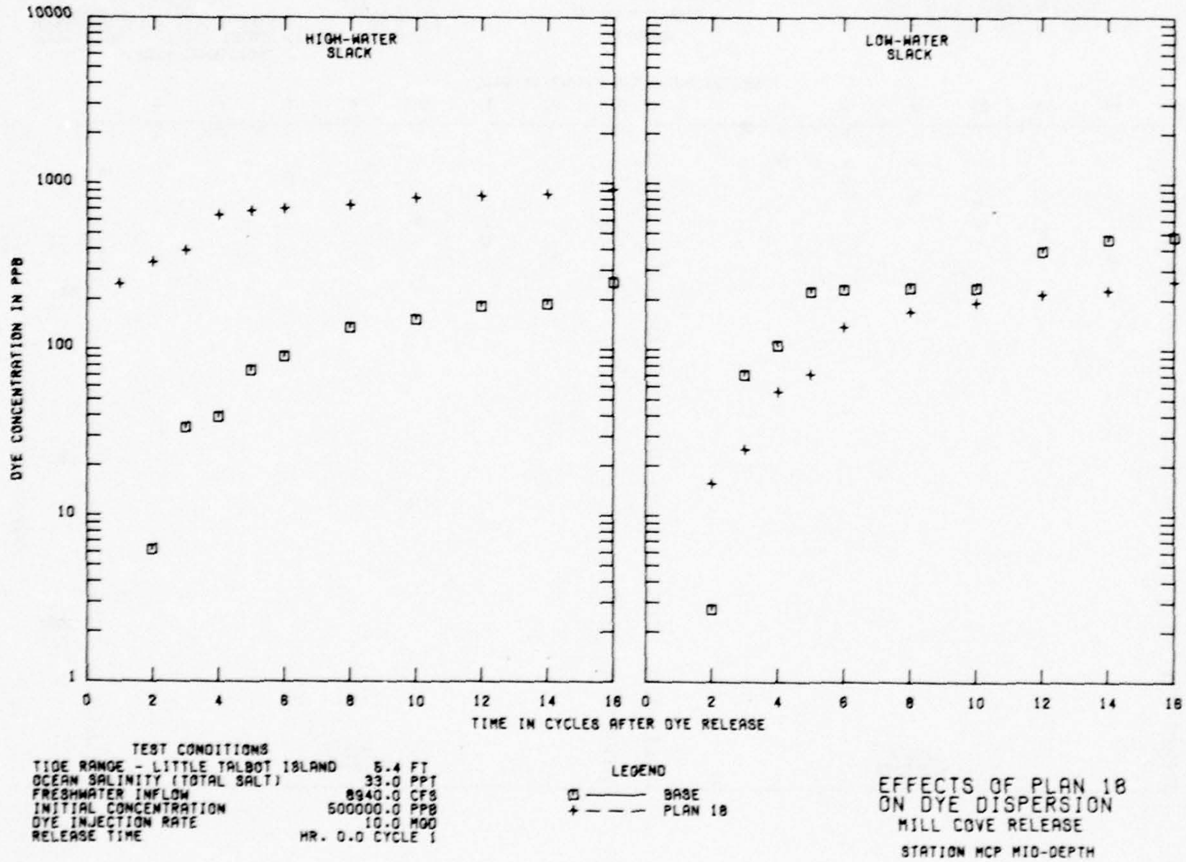

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
BASE
PLAN 18
EFFECTS OF PLAN 18
ON DYE DISPERSION
MILL COVE RELEASE
STATION MCP MID-DEPTH

PLATE 121

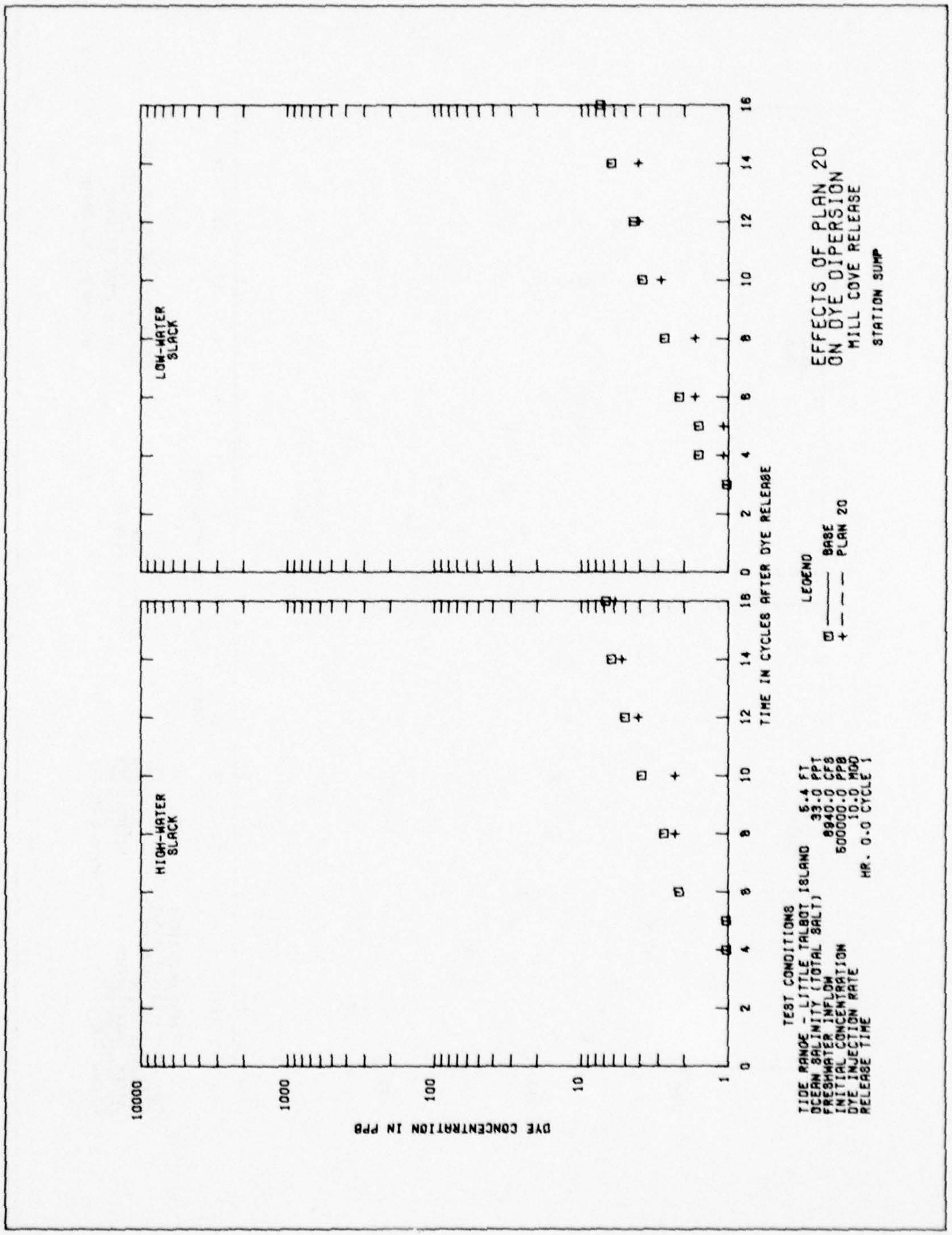
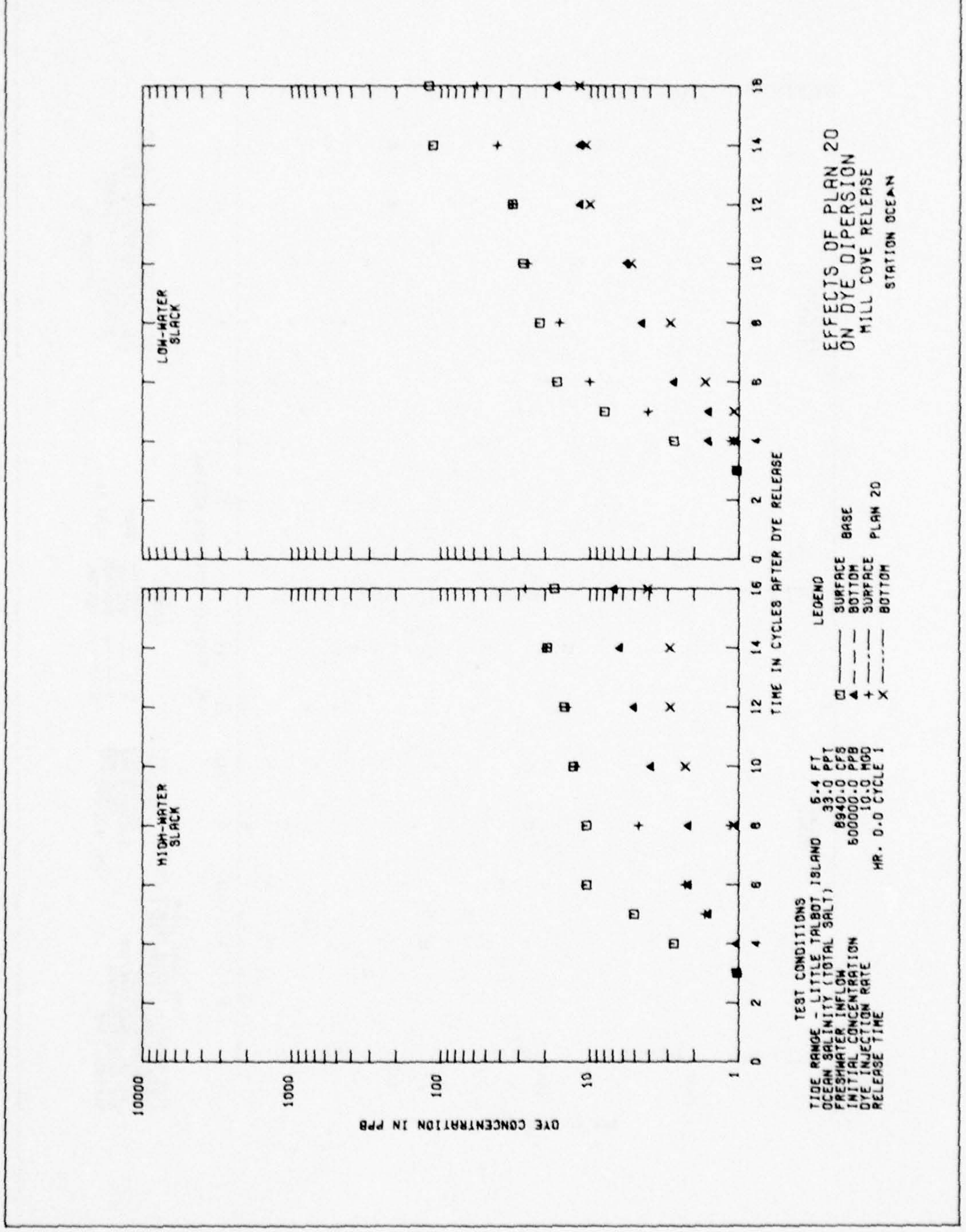
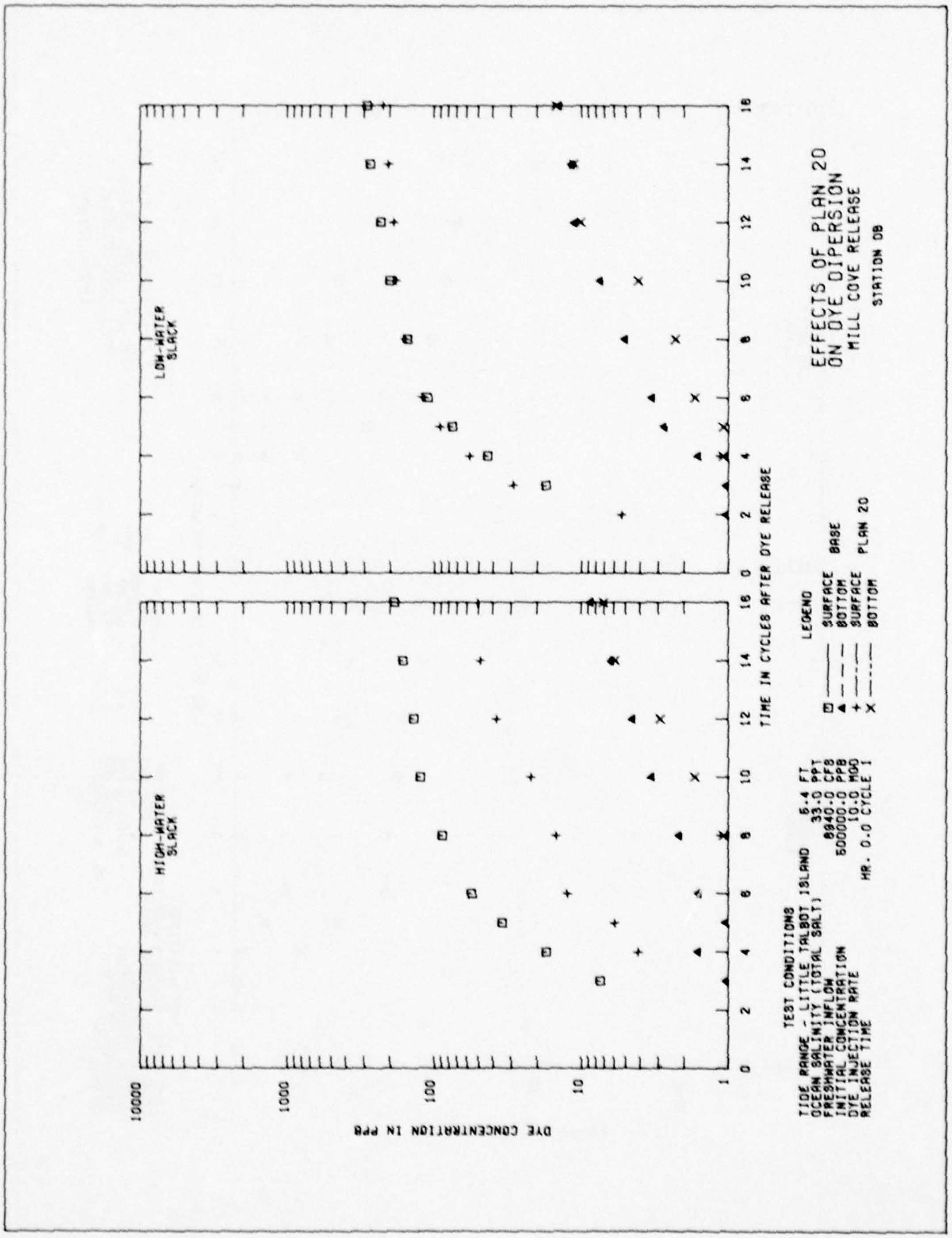

EFFECTS OF PLAN 20
ON DYE DIPERSION
MILL COVE RELEASE
STATION SUMP
HIGH-WATER
SLACK
LOW-WATER
SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
18
TIME IN CYCLES AFTER DYE RELEASE
LEGEND
BASE
PLAN 20
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1

PLATE 122



EFFECTS OF PLAN 20
ON DYE DIPERSION
MILL COVE RELEASE
STATION OCEAN
HIGH-WATER
SLACK
LOW-WATER
SLACK
DYE CONCENTRATION IN PPB
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 6.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 20

PLATE 123



EFFECTS OF PLAN 20
ON DYE DIPERSION
MILL COVE RELEASE
STATION 08
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE BASE
BOTTOM
SURFACE PLAN 20
BOTTOM

PLATE 124

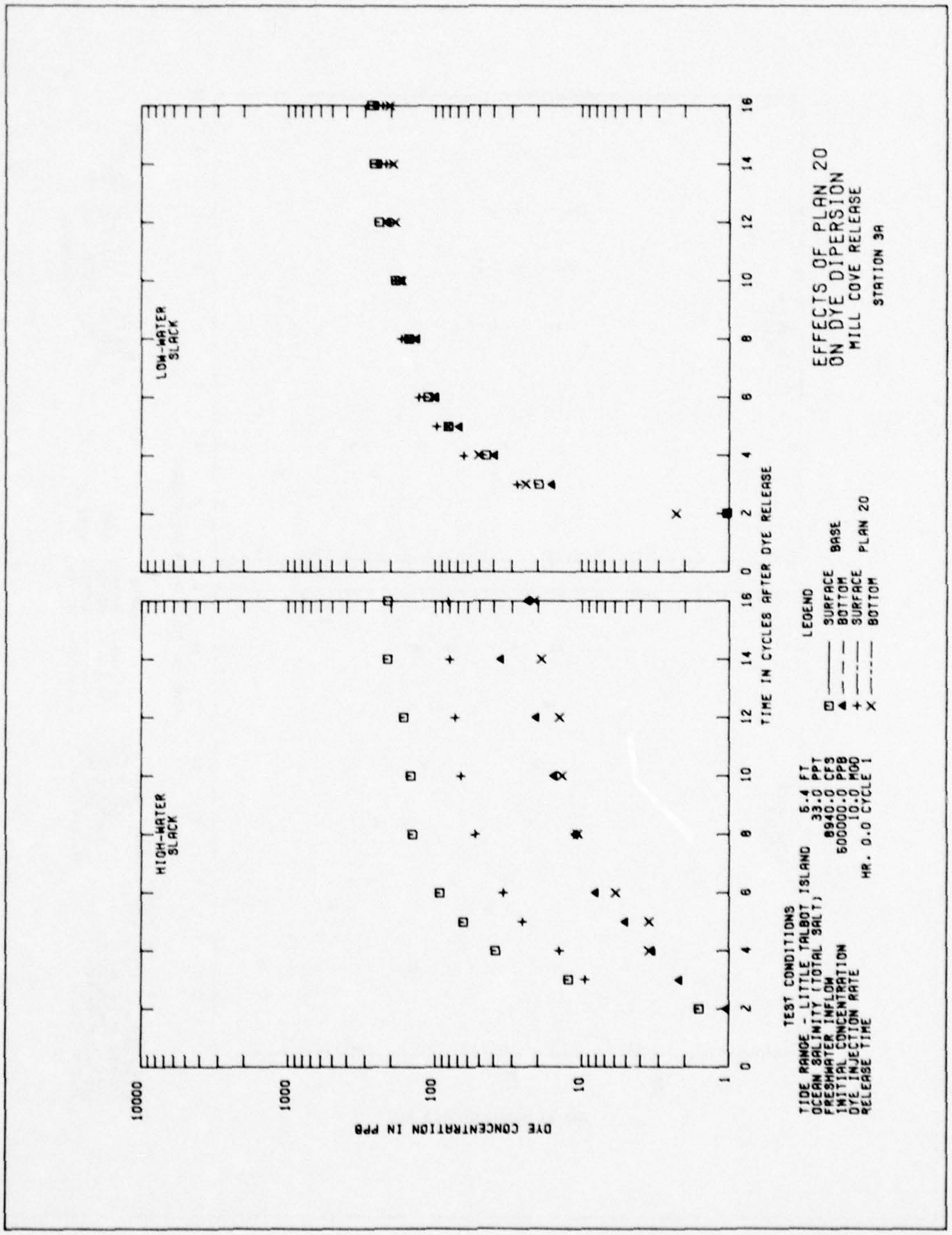

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0 2 4 6 8 10 12 14 16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 20
EFFECTS OF PLAN 20
ON DYE DIPERSION
MILL COVE RELEASE
STATION 3A

PLATE 125

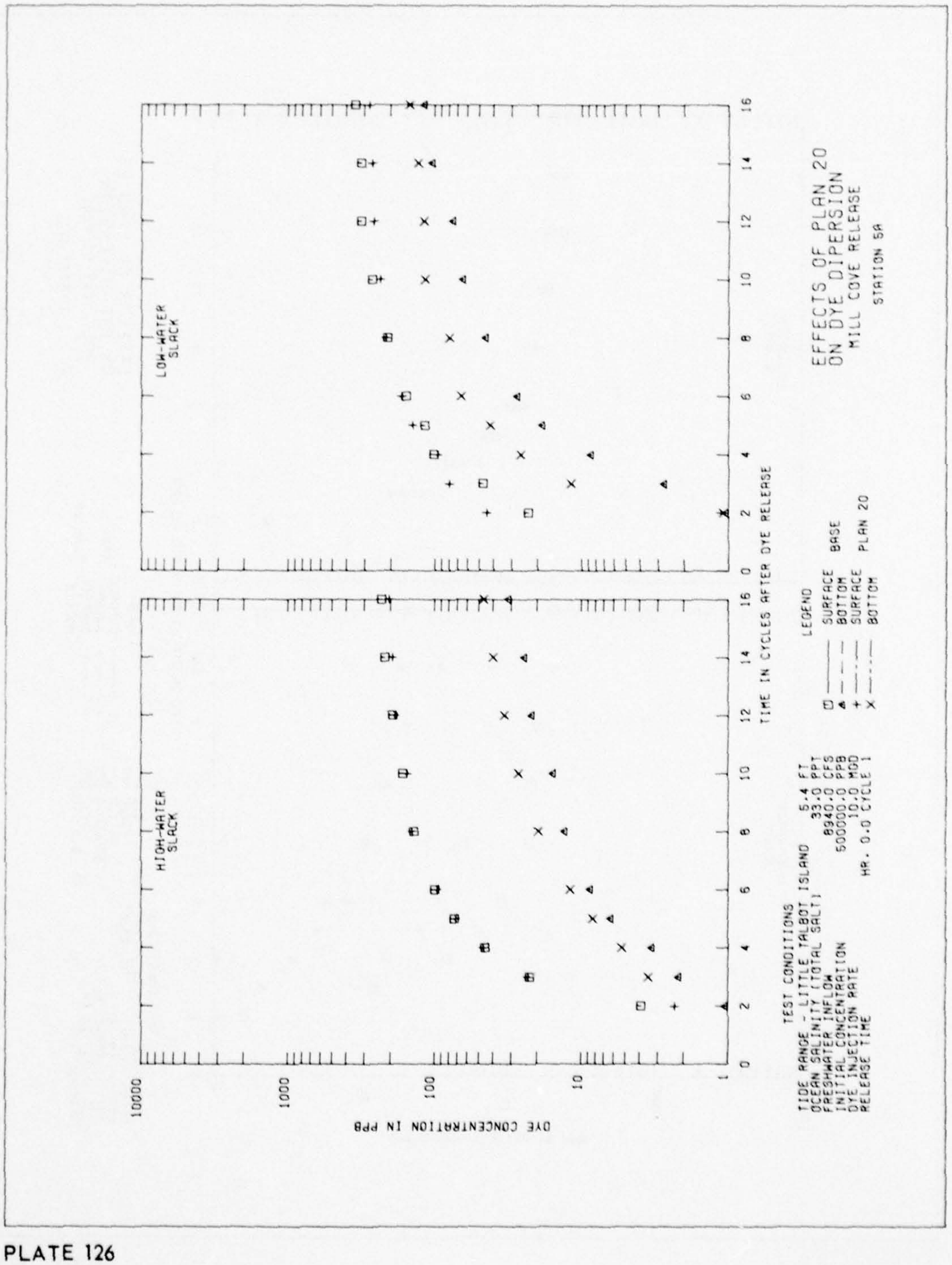
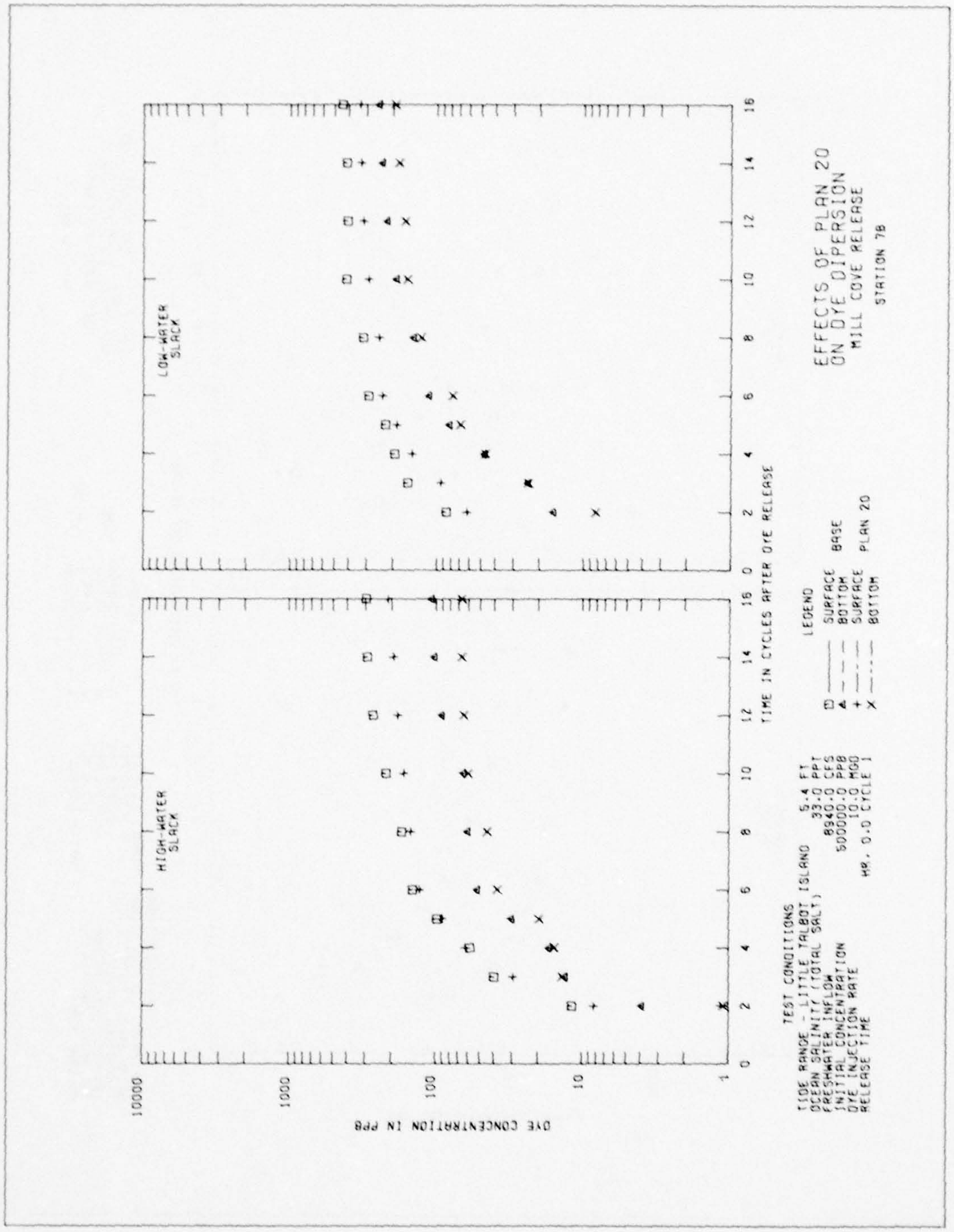
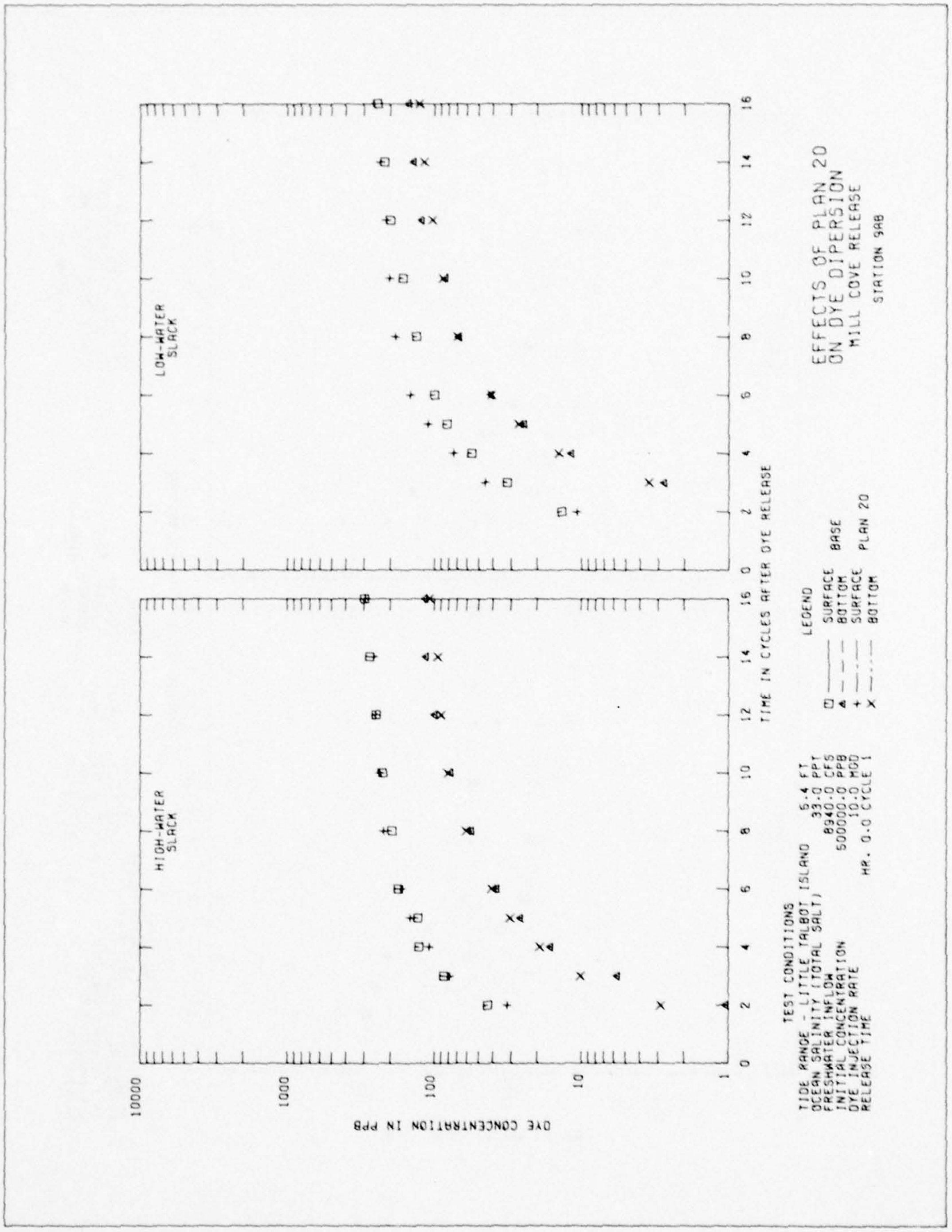

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MOD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE BASE
BOTTOM
SURFACE PLAN 20
BOTTOM
EFFECTS OF PLAN 20
ON DYE DIPERSION
MILL COVE RELEASE
STATION 5A

PLATE 126


EFFECTS OF PLAN 20
ON DYE DIPERSION
MILL COVE RELEASE
STATION 7B
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
TIME IN CYCLES AFTER DYE RELEASE
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 20
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1



EFFECTS OF PLAN 20
ON DYE DIPERSION
MILL COVE RELEASE
STATION 9AB
HIGH-WATER
SLACK
LOW-WATER
SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 20
TEST CONDITIONS
TIDE RANGE -- LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1

PLATE 128

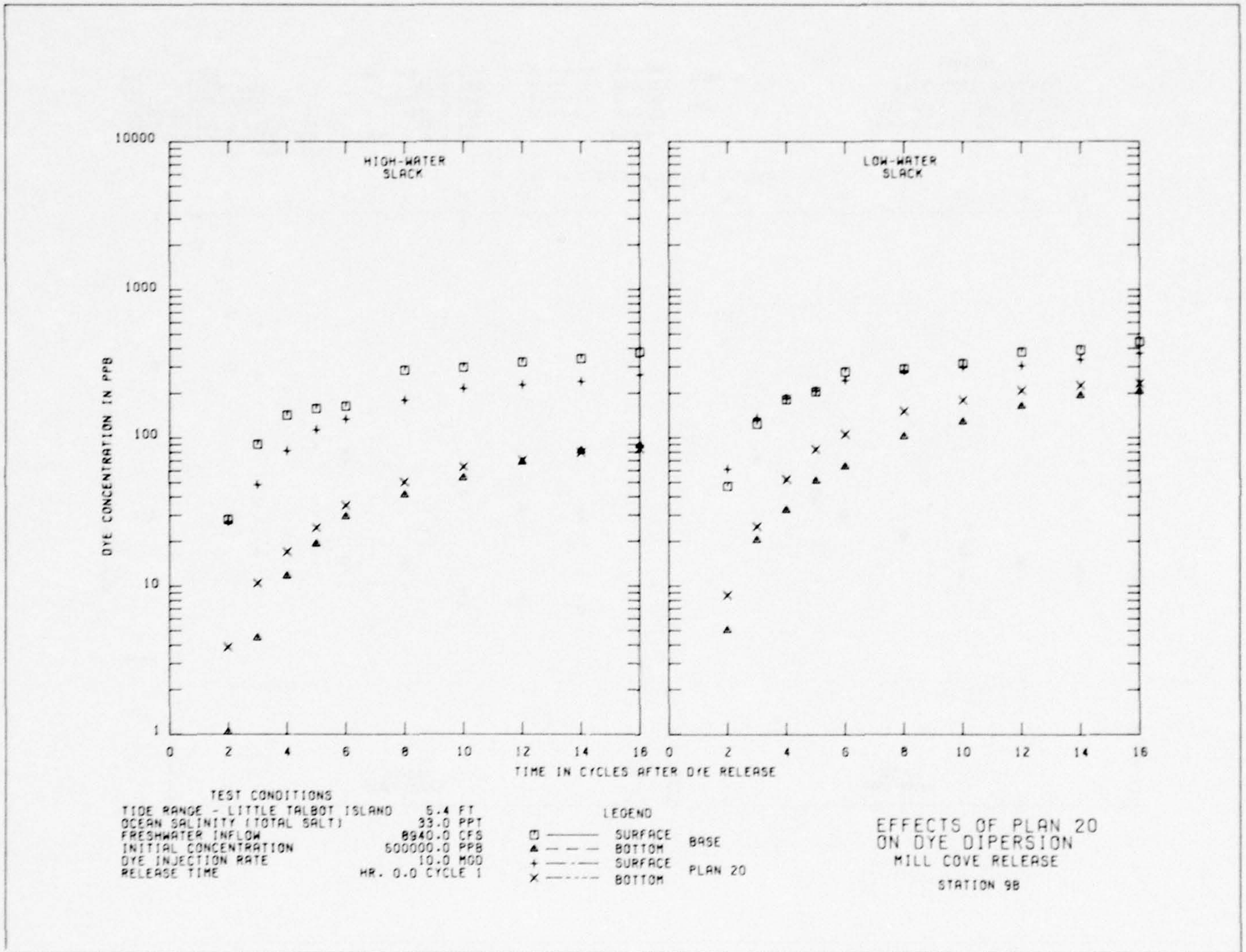

HIGH-WATER SLACK
LOW-WATER SLACK
10000
1000
100
10
1
DYE CONCENTRATION IN PPB
0 2 4 6 8 10 12 14 16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE BASE
BOTTOM
SURFACE PLAN 20
BOTTOM
EFFECTS OF PLAN 20
ON DYE DIPERSION
MILL COVE RELEASE
STATION 9B

PLATE 129

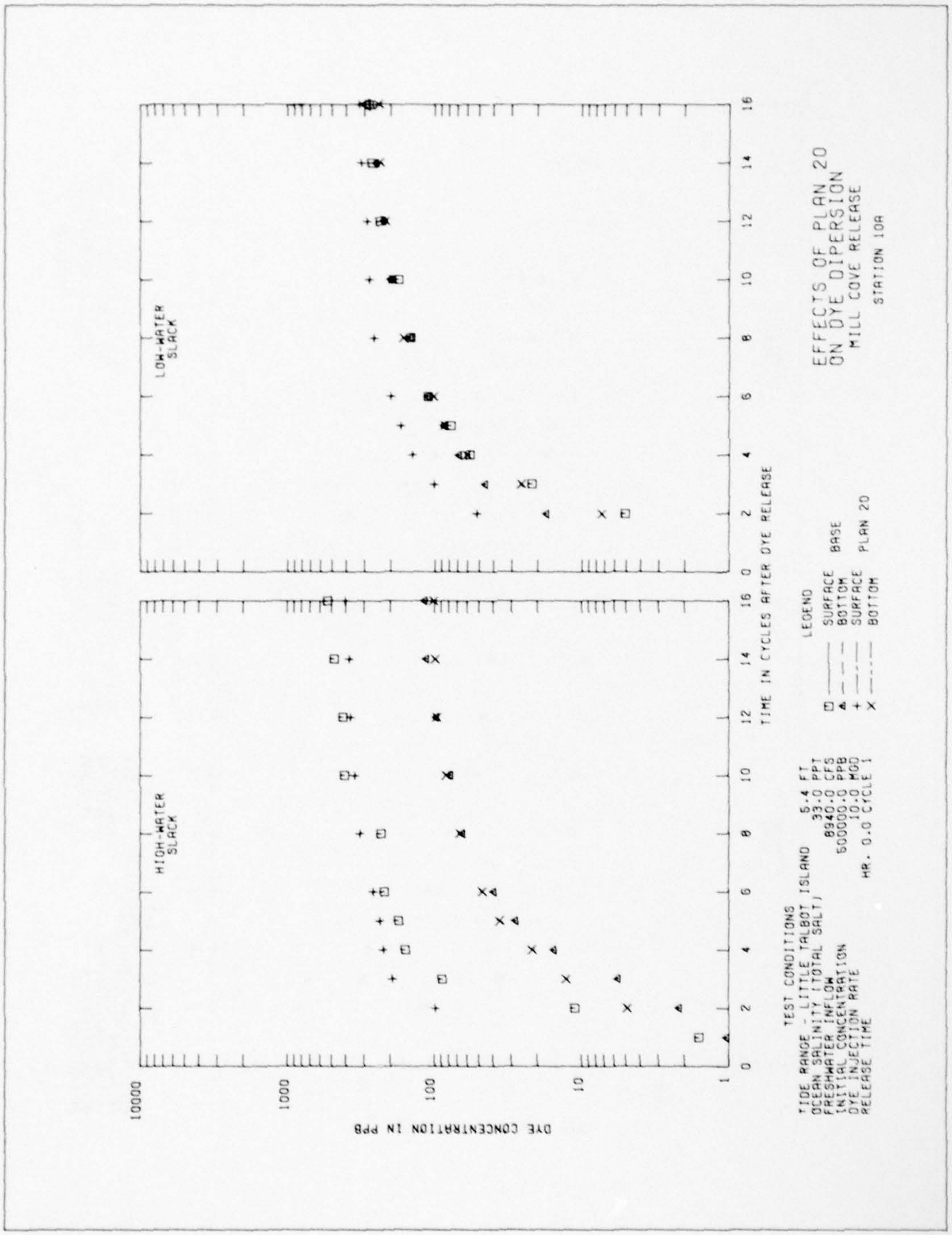
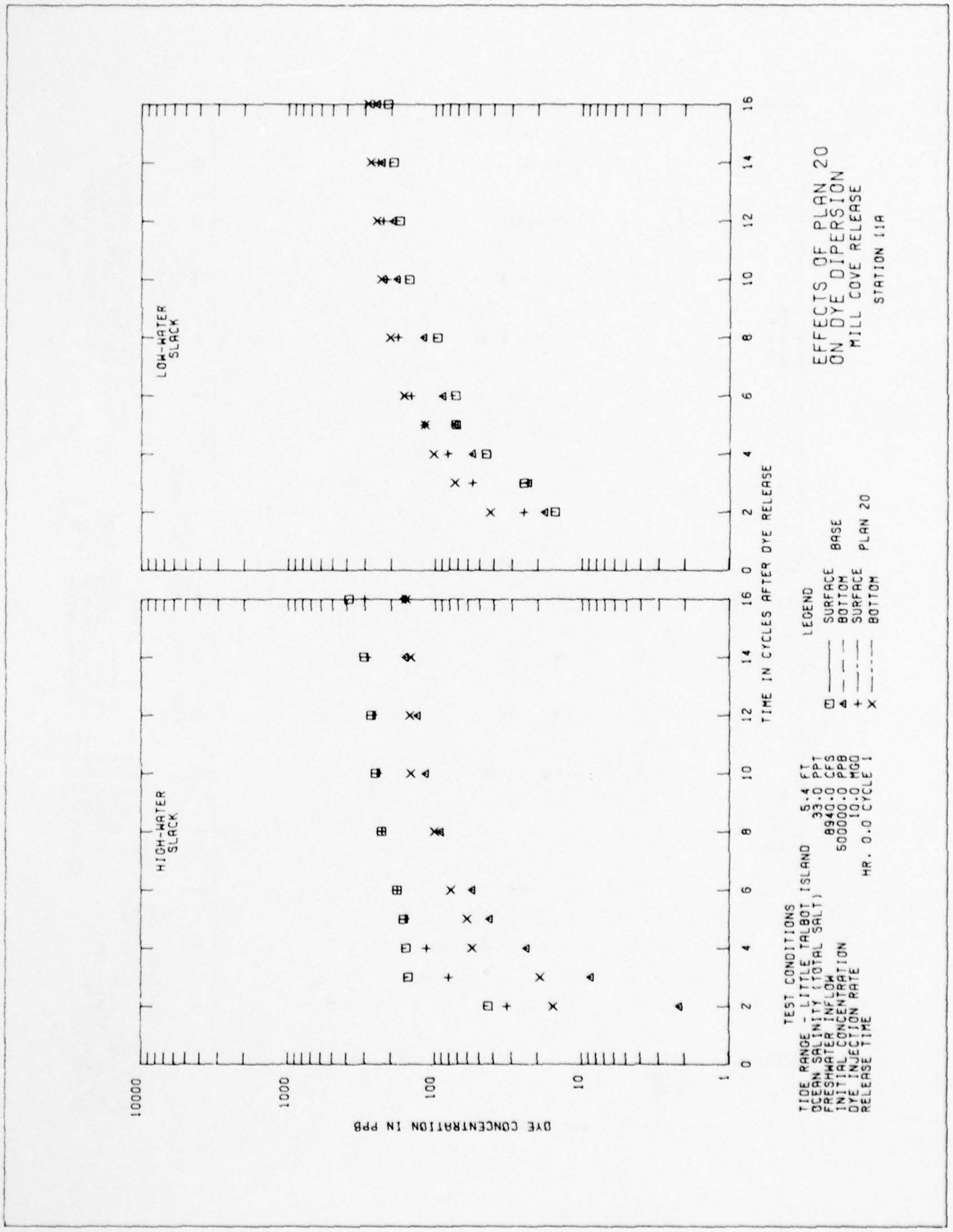

EFFECTS OF PLAN 20
ON DYE DIPERSION
MILL COVE RELEASE
STATION 10A
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
TIME IN CYCLES AFTER DYE RELEASE
0
2
4
6
8
10
12
14
16
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE BASE
BOTTOM
SURFACE PLAN 20
BOTTOM

PLATE 130



EFFECTS OF PLAN 20
ON DYE DIPERSION
MILL COVE RELEASE
STATION 11A
HIGH-WATER
SLACK
LOW-WATER
SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
TIME IN CYCLES AFTER DYE RELEASE
0
2
4
6
8
10
12
14
16
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 20

PLATE 131

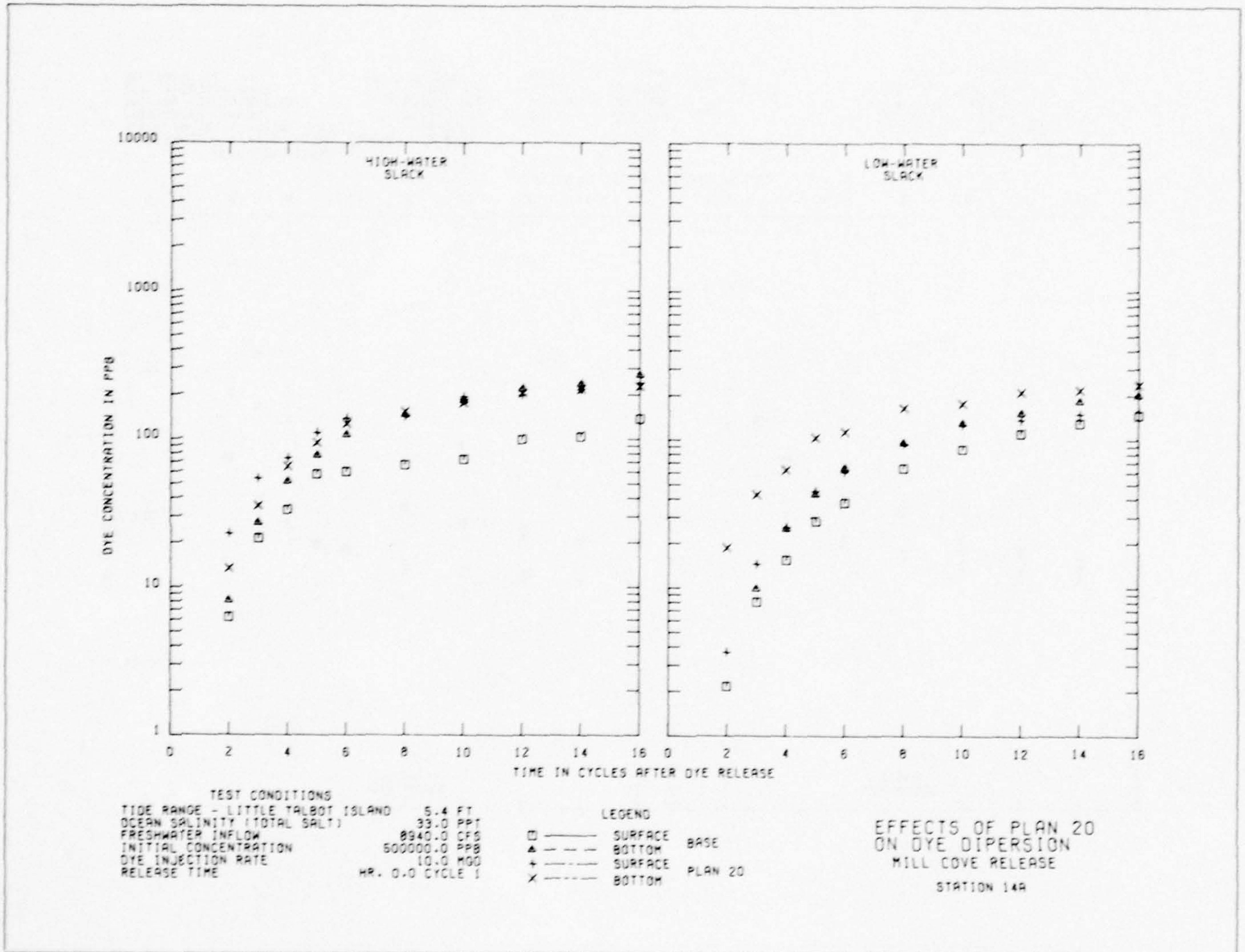

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0 2 4 6 8 10 12 14 16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 20
EFFECTS OF PLAN 20
ON DYE DIPERSION
MILL COVE RELEASE
STATION 14A

PLATE 132

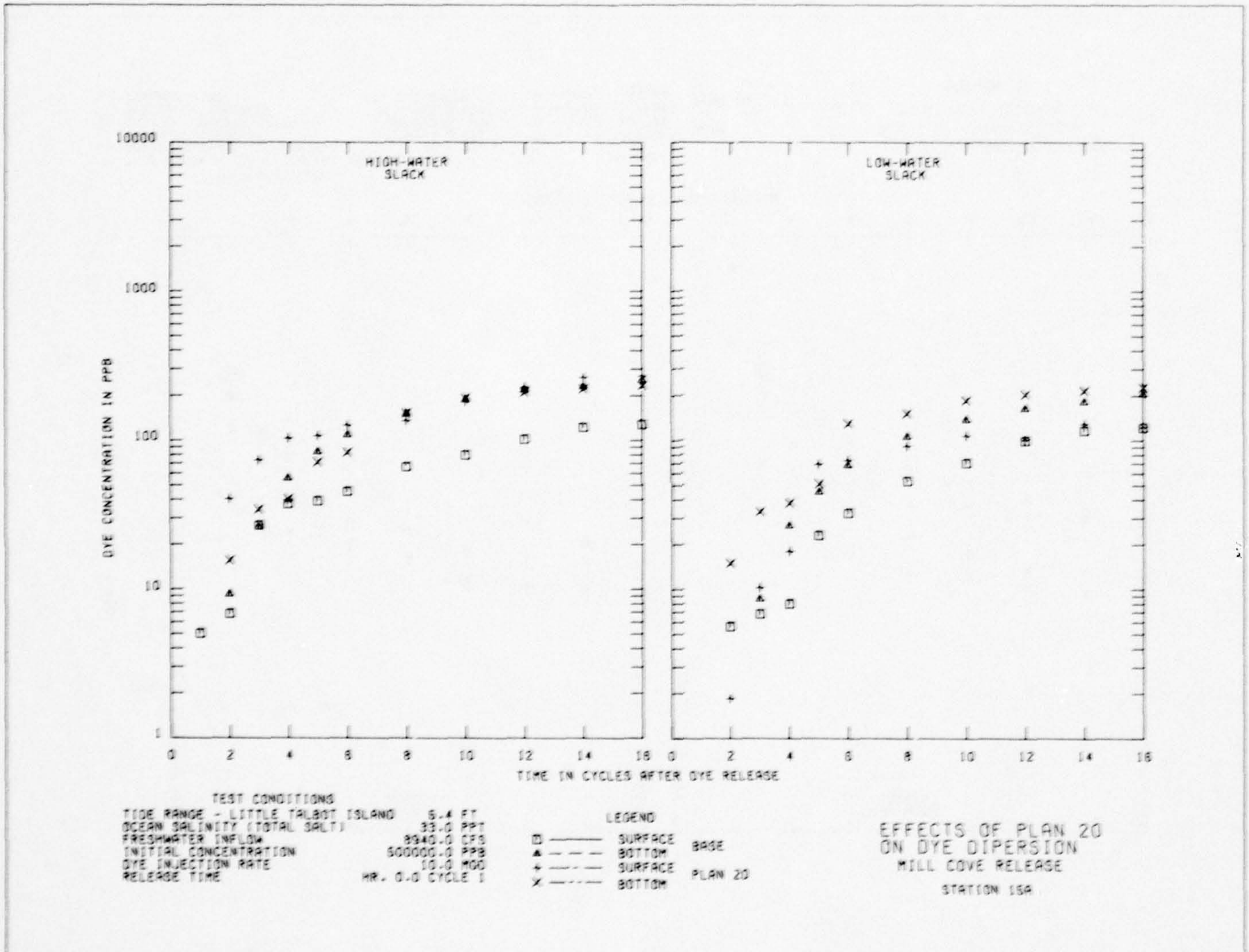
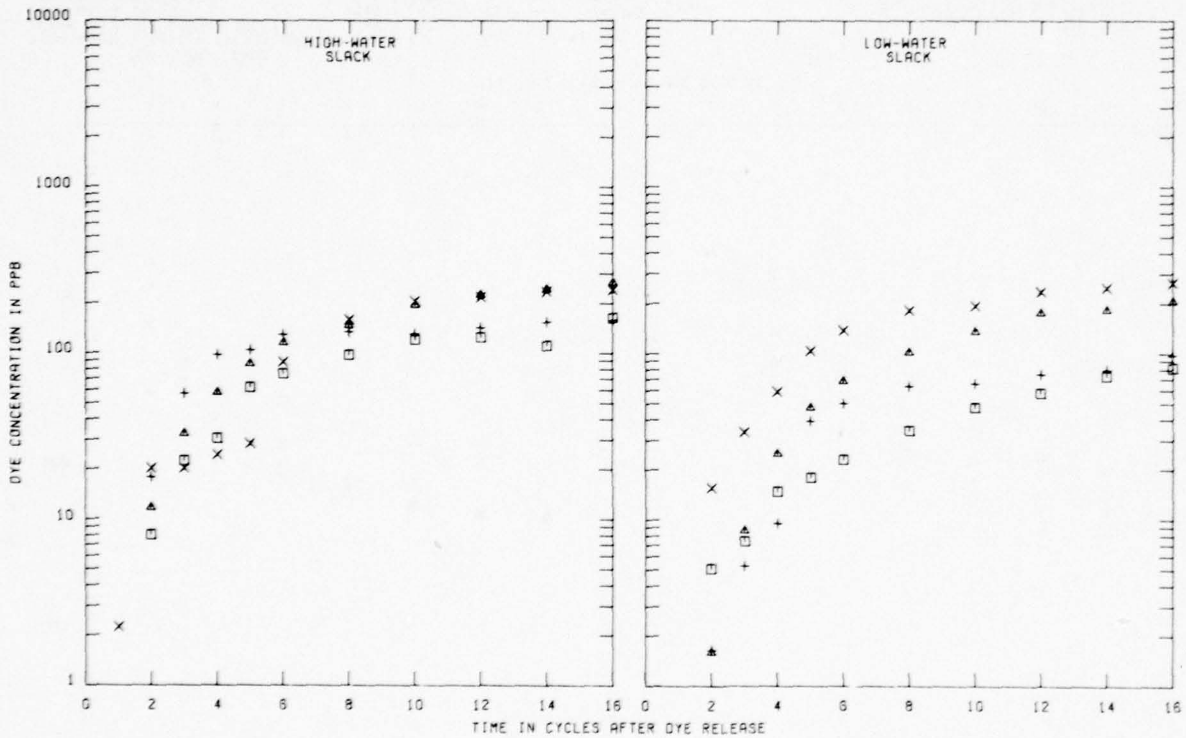

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 20
EFFECTS OF PLAN 20
ON DYE DIPERSION
MILL COVE RELEASE
STATION 15A

PLATE 133



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	10.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

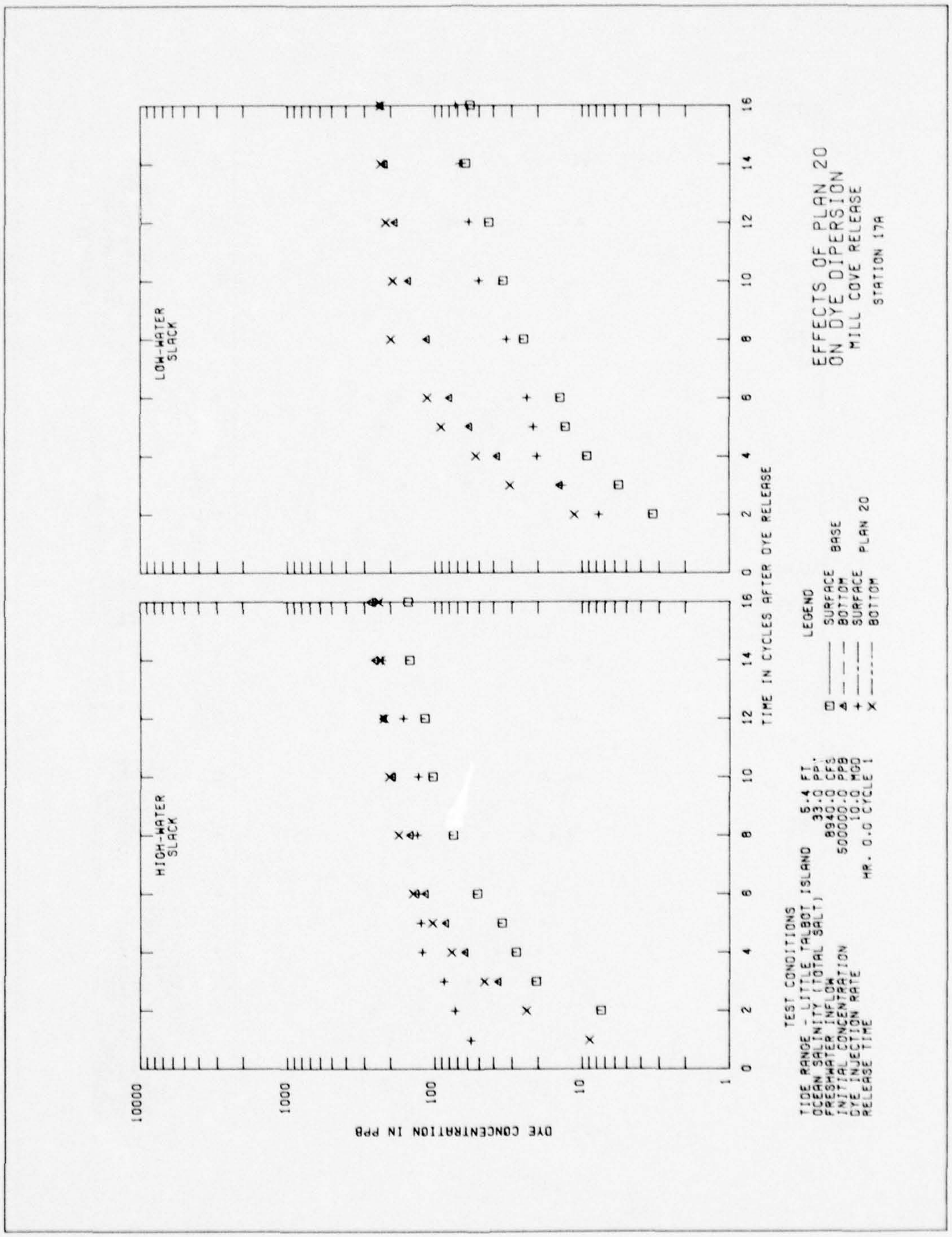
LEGEND

⊡ ————	SURFACE	BASE
▲ — — —	BOTTOM	
+ —·—·—	SURFACE	PLAN 20
× —··—··	BOTTOM	

EFFECTS OF PLAN 20
ON DYE DIPERSION
MILL COVE RELEASE

STATION 16A

PLATE 134



HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0 2 4 6 8 10 12 14 16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE BASE
BOTTOM
SURFACE PLAN 20
BOTTOM
EFFECTS OF PLAN 20
ON DYE DIPERSION
MILL COVE RELEASE
STATION 17A

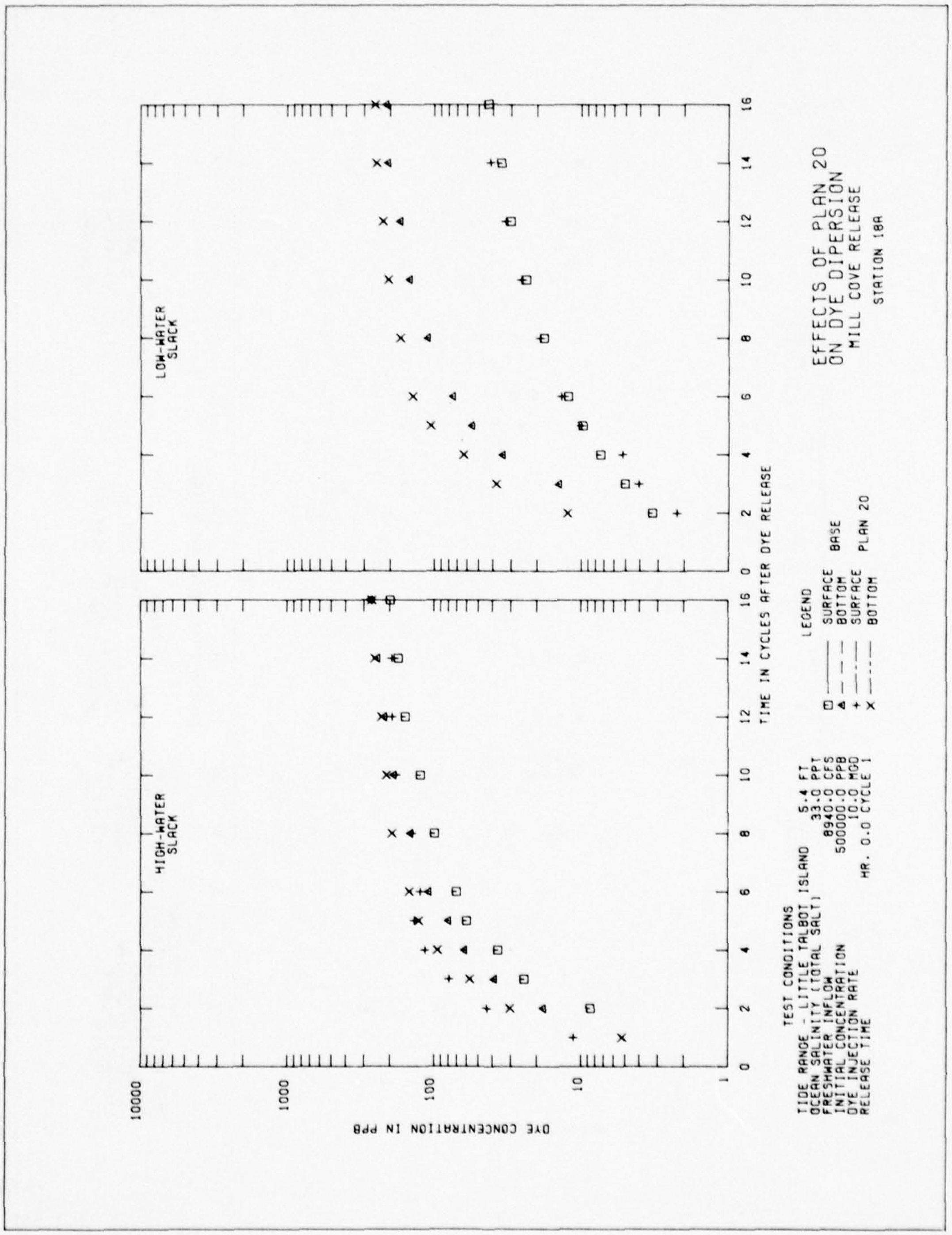
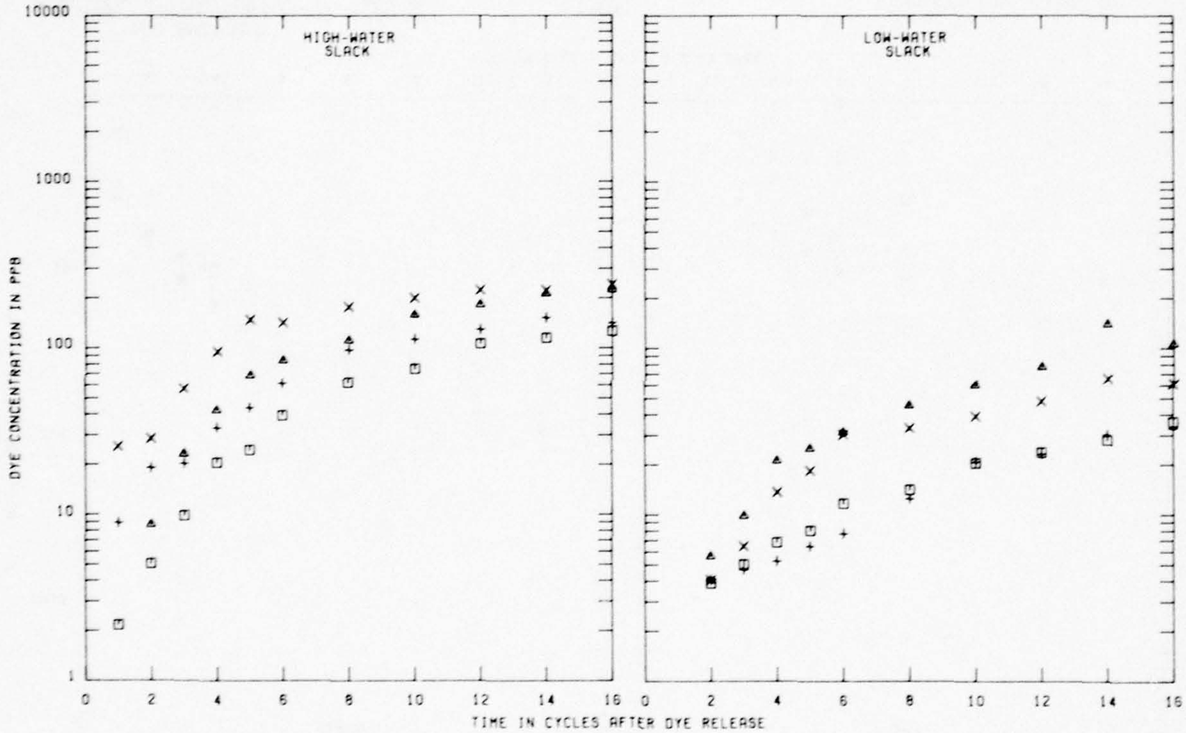

EFFECTS OF PLAN 20
ON DYE DIPERSION
MILL COVE RELEASE
STATION 18A
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
TIME IN CYCLES AFTER DYE RELEASE
0
2
4
6
8
10
12
14
16
LEGEND
SURFACE
BOTTOM
SURFACE
BOTTOM
BASE
PLAN 20
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1

PLATE 136



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	10.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

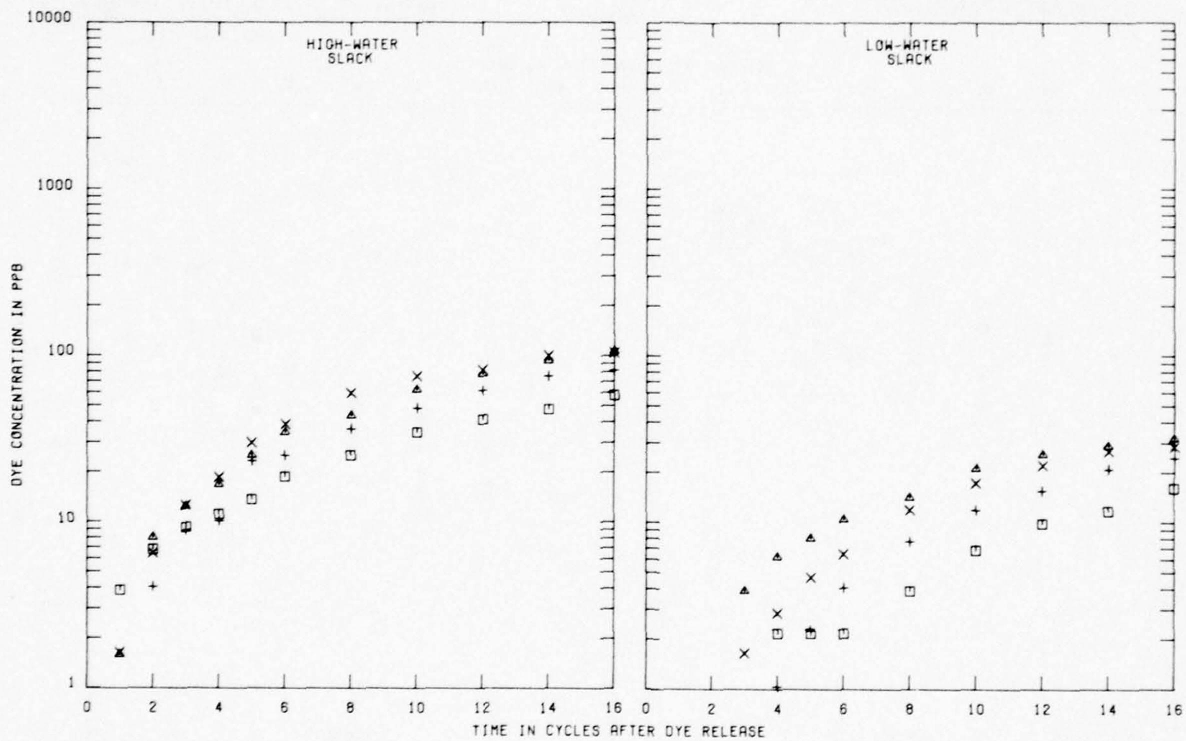
LEGEND

⊡ ———	SURFACE	BASE
▲ — — —	BOTTOM	
+ —·—·—	SURFACE	PLAN 20
× —··—··	BOTTOM	

EFFECTS OF PLAN 20
ON DYE DIPERSION
MILL COVE RELEASE

STATION 20A

PLATE 137



TEST CONDITIONS

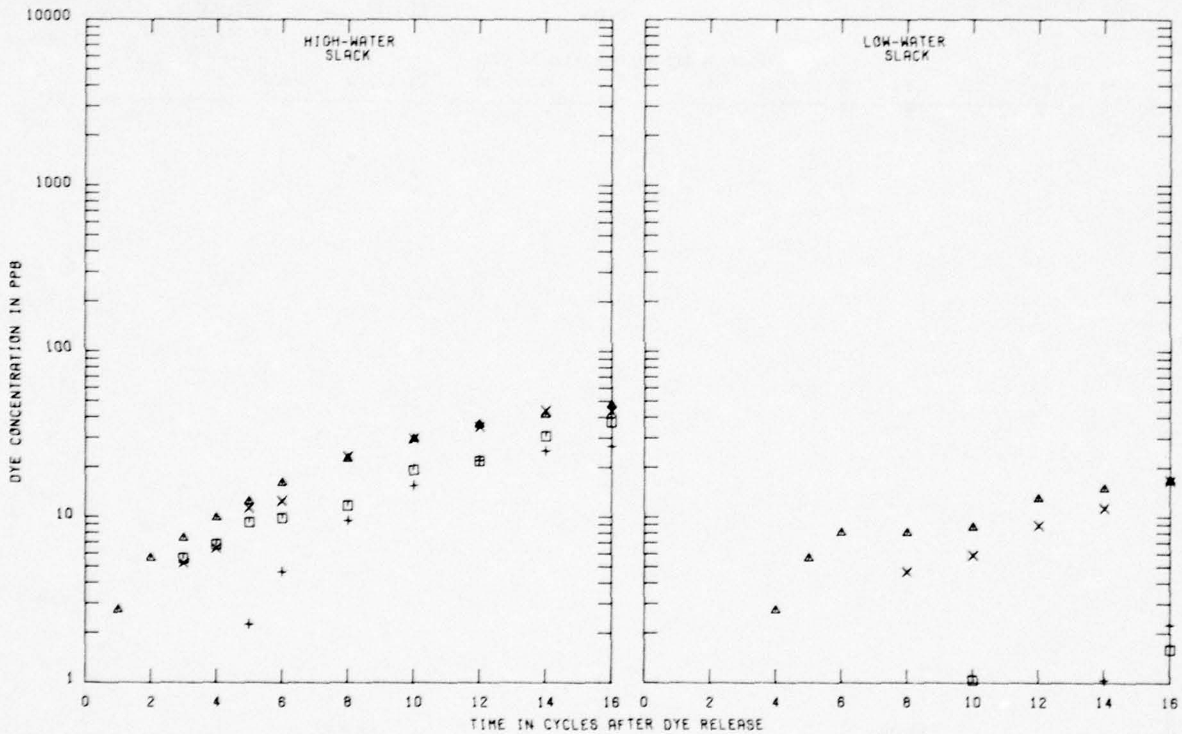
TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	10.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

⊡ ———	SURFACE	BASE
△ — — —	BOTTOM	
+ —·—	SURFACE	PLAN 20
× —··—	BOTTOM	

EFFECTS OF PLAN 20
ON DYE DIPERSION
MILL COVE RELEASE

STATION 24A



TEST CONDITIONS

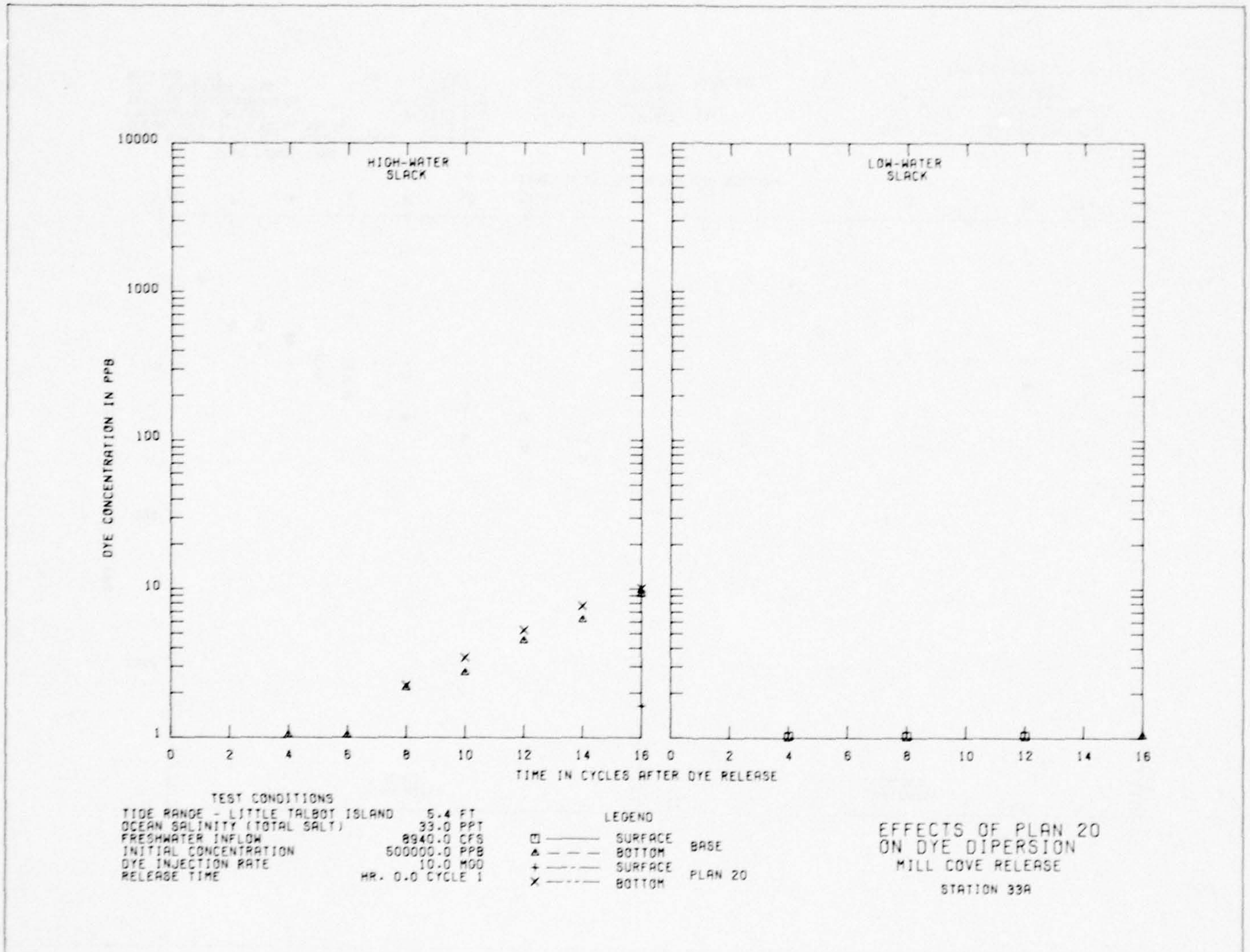
TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	10.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

□ ———	SURFACE	BASE
△ — — —	BOTTOM	
+ —·—·—	SURFACE	PLAN 20
× —··—··—	BOTTOM	

EFFECTS OF PLAN 20
ON DYE DIPERSION
MILL COVE RELEASE

STATION 28B



HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0 2 4 6 8 10 12 14 16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE BASE
BOTTOM
SURFACE PLAN 20
BOTTOM
EFFECTS OF PLAN 20
ON DYE DIPERSION
MILL COVE RELEASE
STATION 33A

PLATE 140

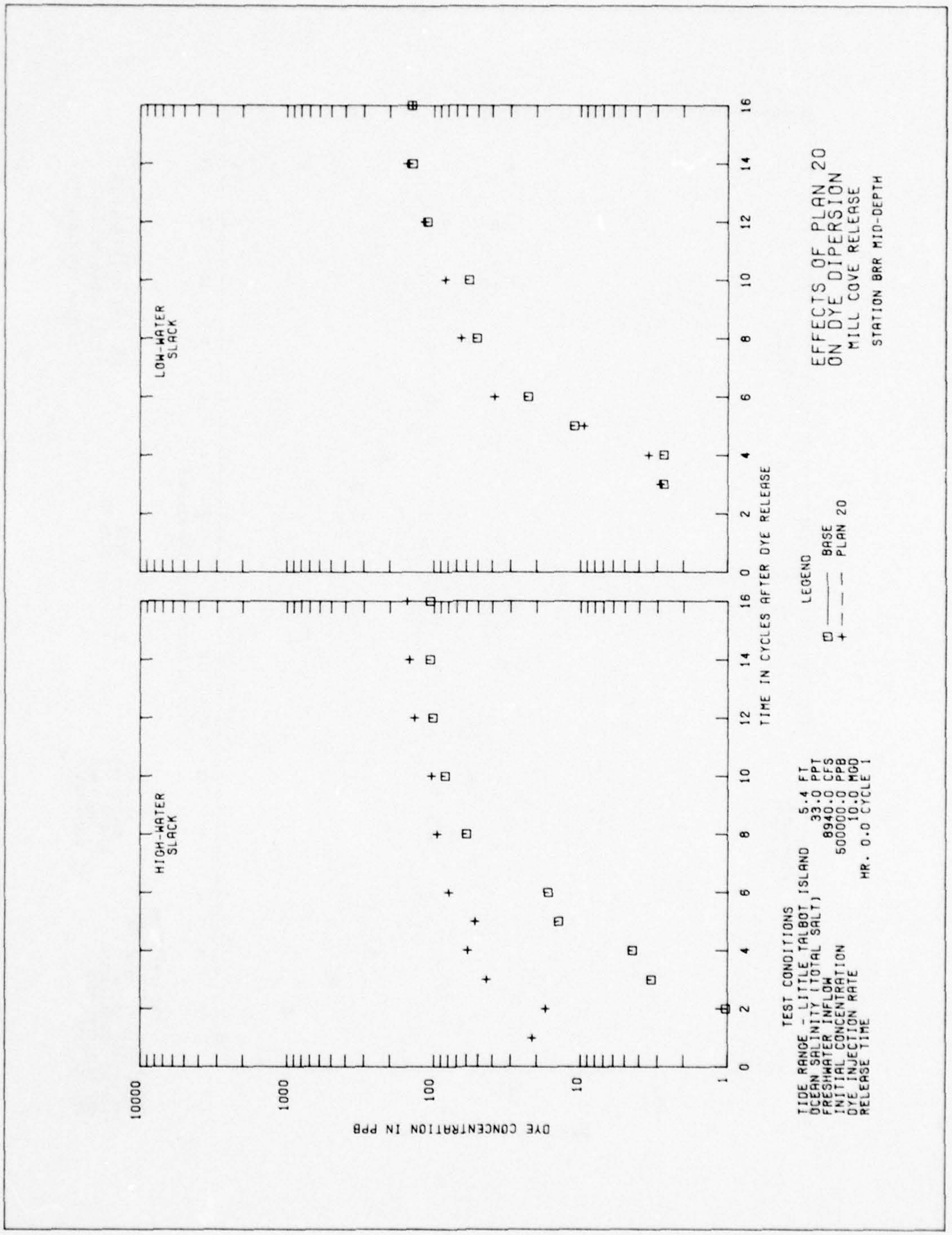
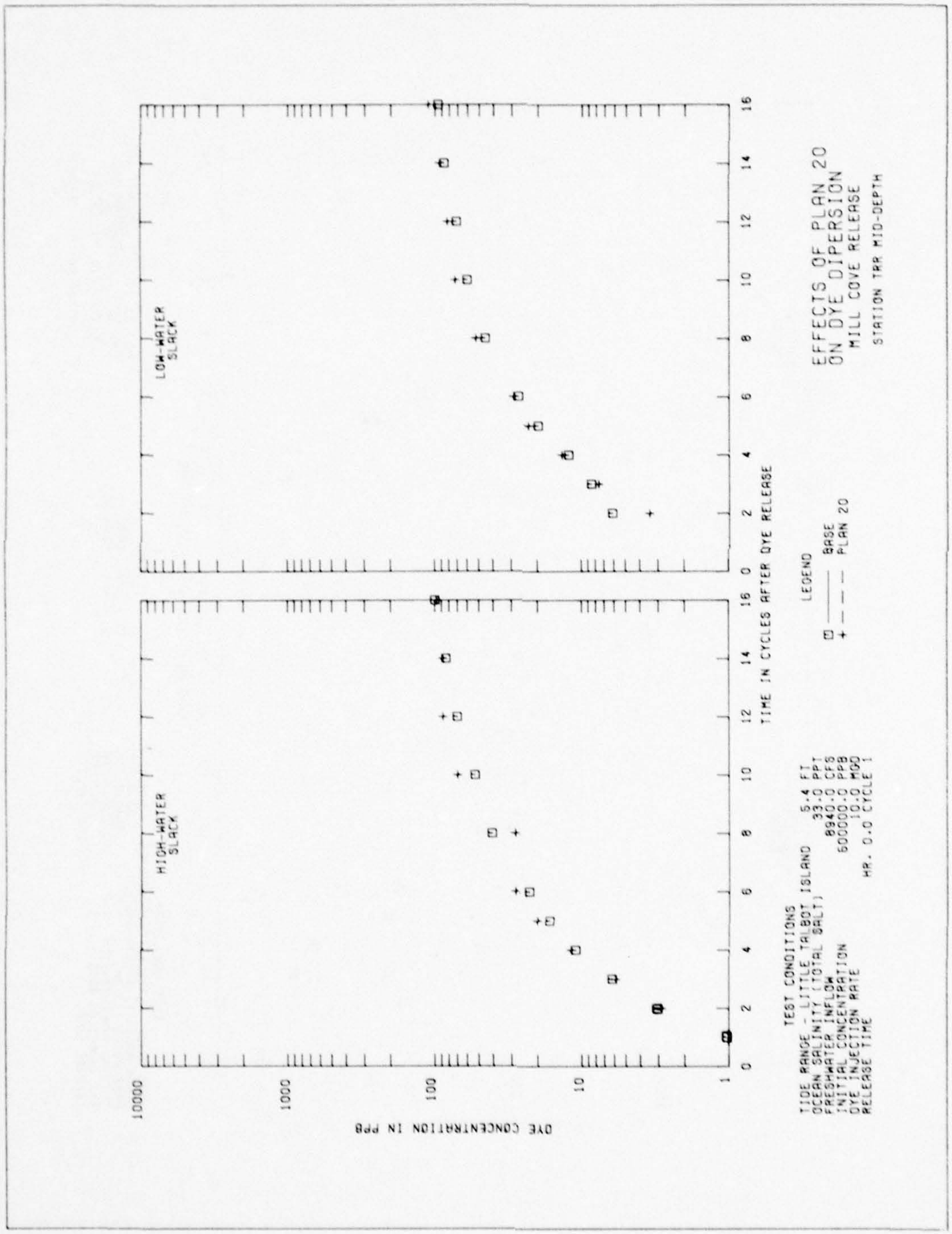

DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
HIGH-WATER SLACK
LOW-WATER SLACK
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
BASE
PLAN 20
EFFECTS OF PLAN 20
ON DYE DIPERSION
MILL COVE RELEASE
STATION BRR MID-DEPTH

PLATE 141



EFFECTS OF PLAN 20
ON DYE DIPERSION
MILL COVE RELEASE
STATION TRR MID-DEPTH
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
TIME IN CYCLES AFTER DYE RELEASE
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
LEGEND
BASE
PLAN 20
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1

PLATE 142

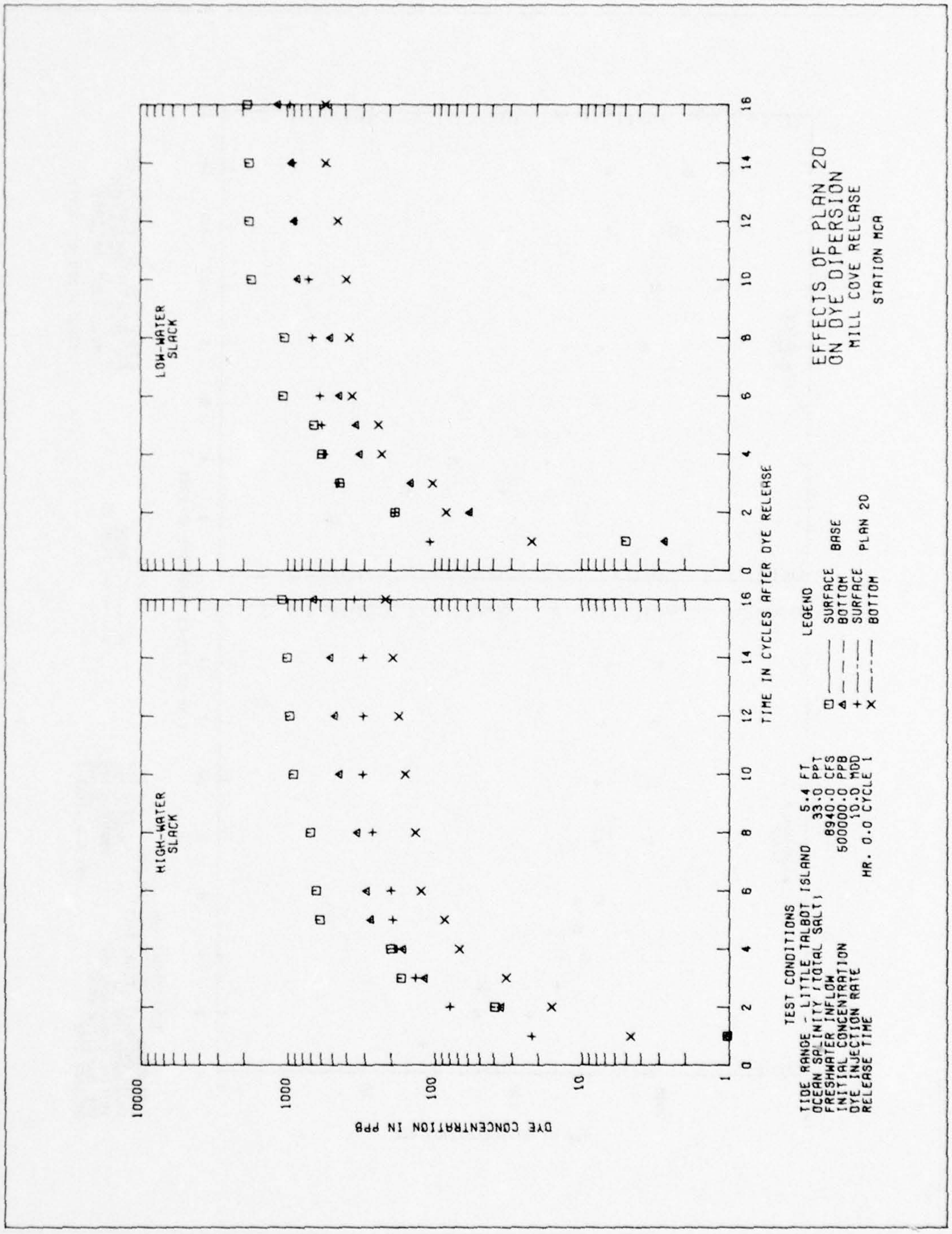

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
TIME IN CYCLES AFTER DYE RELEASE
EFFECTS OF PLAN 20 ON DYE DIPERSION
MILL COVE RELEASE
STATION MCA
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MOD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE BASE
BOTTOM
SURFACE PLAN 20
BOTTOM

PLATE 143

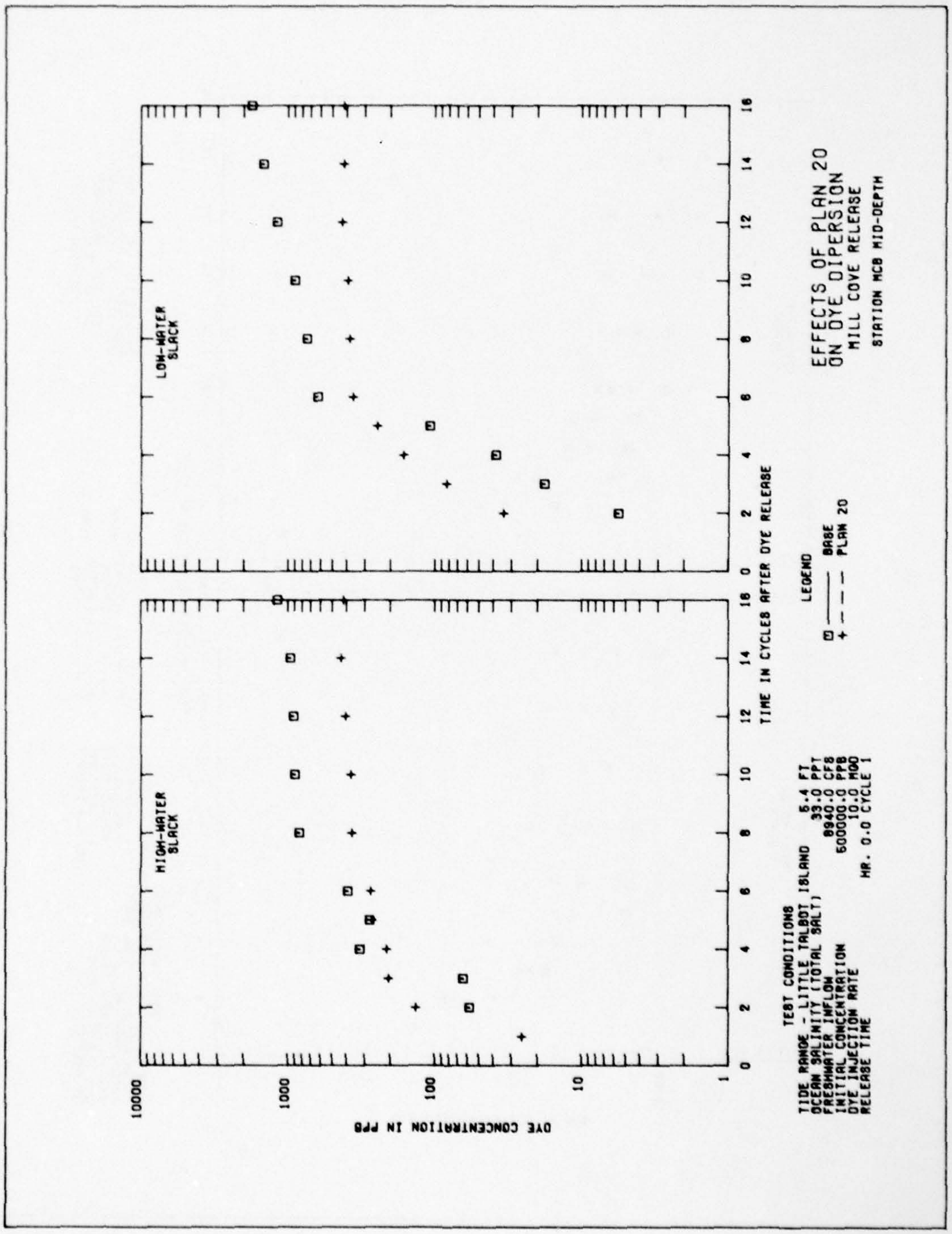
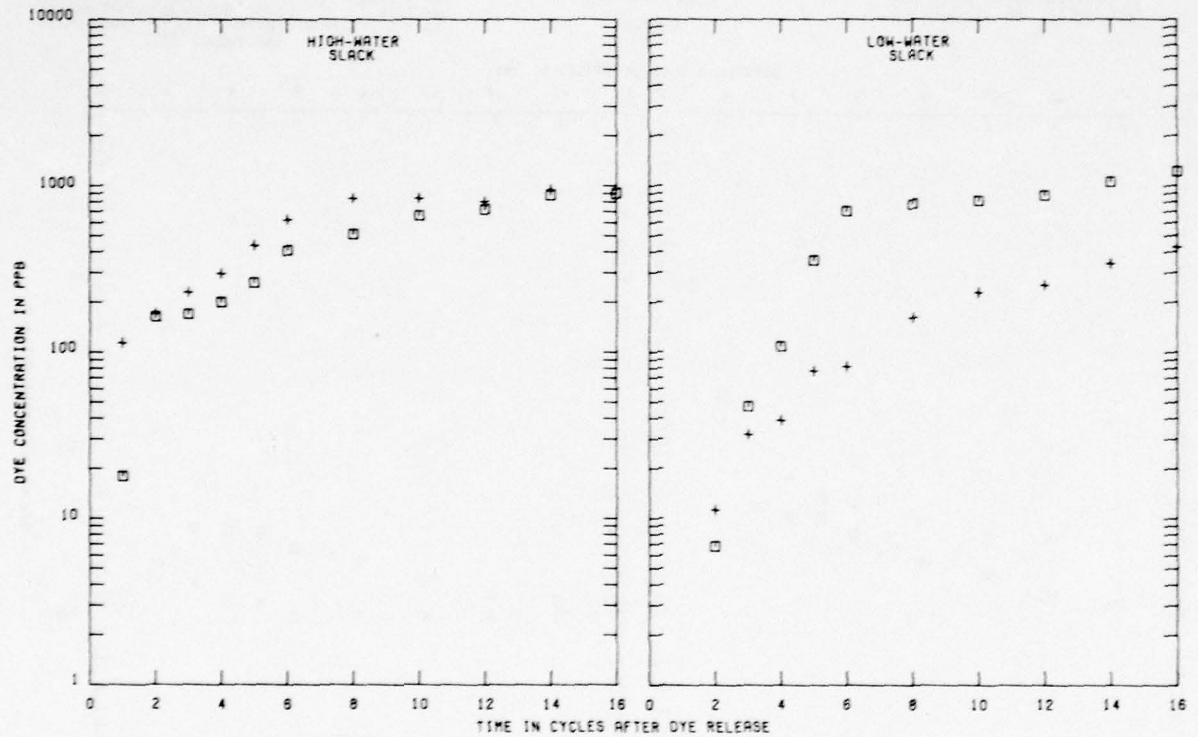

EFFECTS OF PLAN 20
ON DYE DIPERSION
MILL COVE RELEASE
STATION MCB MID-DEPTH
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
BASE
PLAN 20

PLATE 144



TEST CONDITIONS

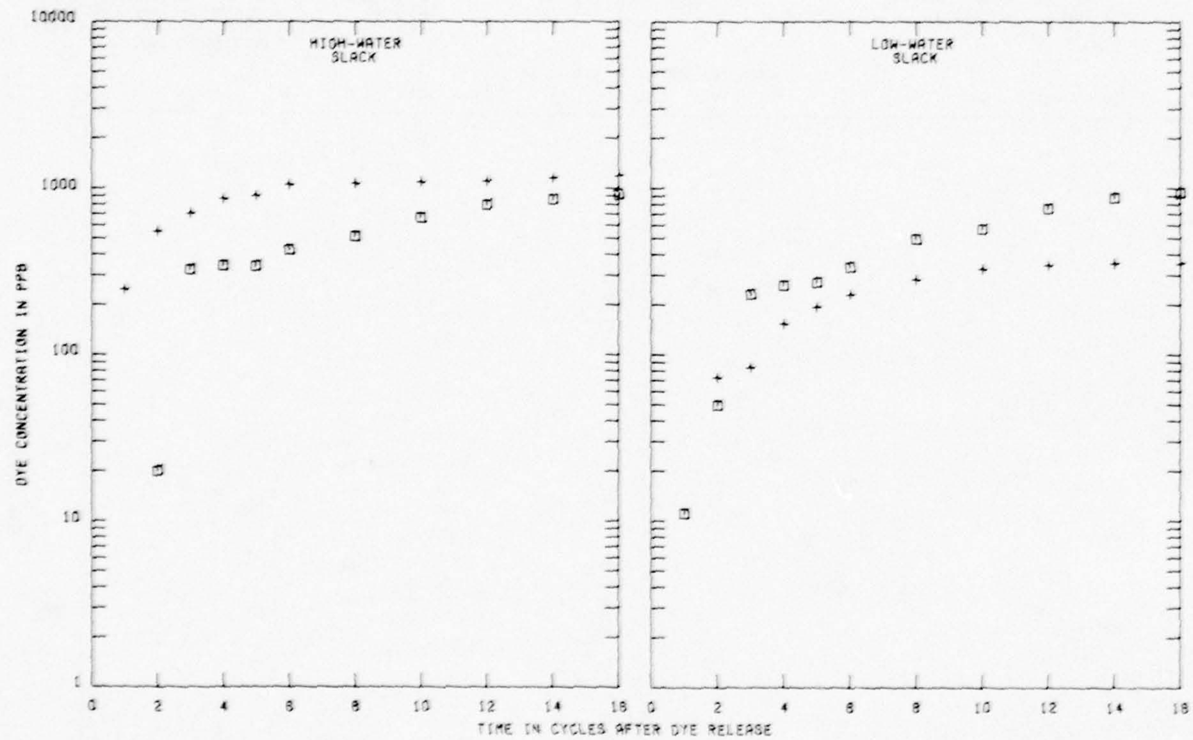
TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8340.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	10.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

⊡ ——— BASE
+ — — — PLAN 20

EFFECTS OF PLAN 20
ON DYE DIPERSION
MILL COVE RELEASE

STATION MCC MID-DEPTH



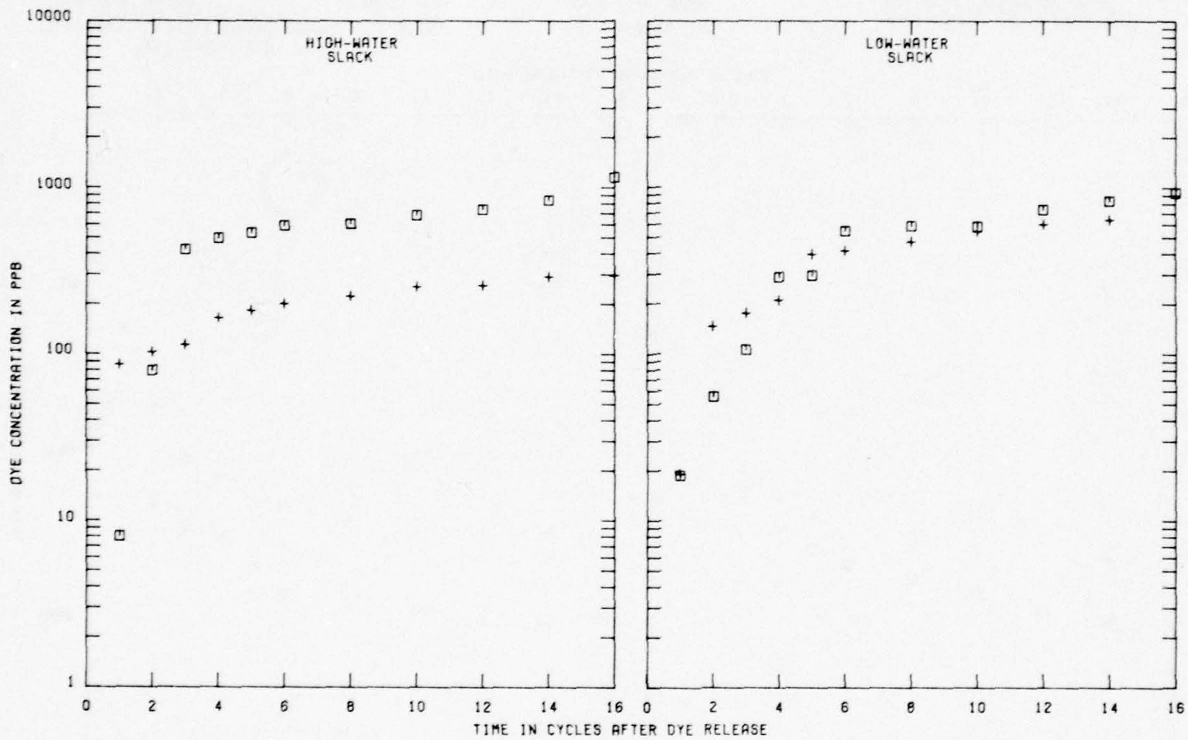
TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	10.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

⊡ ——— BASE
\+ — — — PLAN 20

EFFECTS OF PLAN 20
ON DYE DIPERSION
MILL COVE RELEASE
STATION MCD MID-DEPTH



TEST CONDITIONS

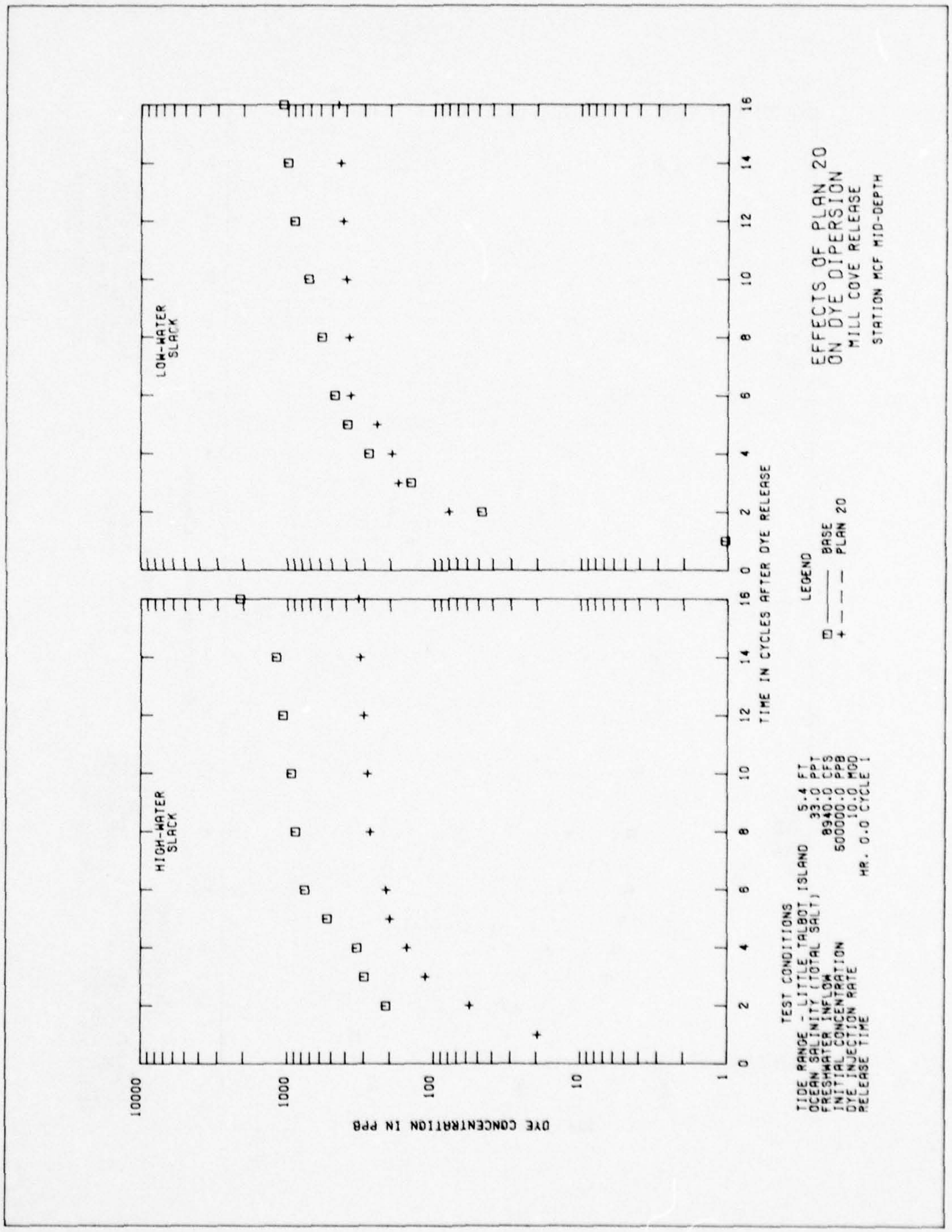
TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	10.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

⊡ ——— BASE
+ — — — PLAN 20

EFFECTS OF PLAN 20
ON DYE DIPERSION
MILL COVE RELEASE

STATION MCE MID-DEPTH



EFFECTS OF PLAN 20
ON DYE DIPERSION
MILL COVE RELEASE
STATION MCF MID-DEPTH
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
BASE
PLAN 20

PLATE 148

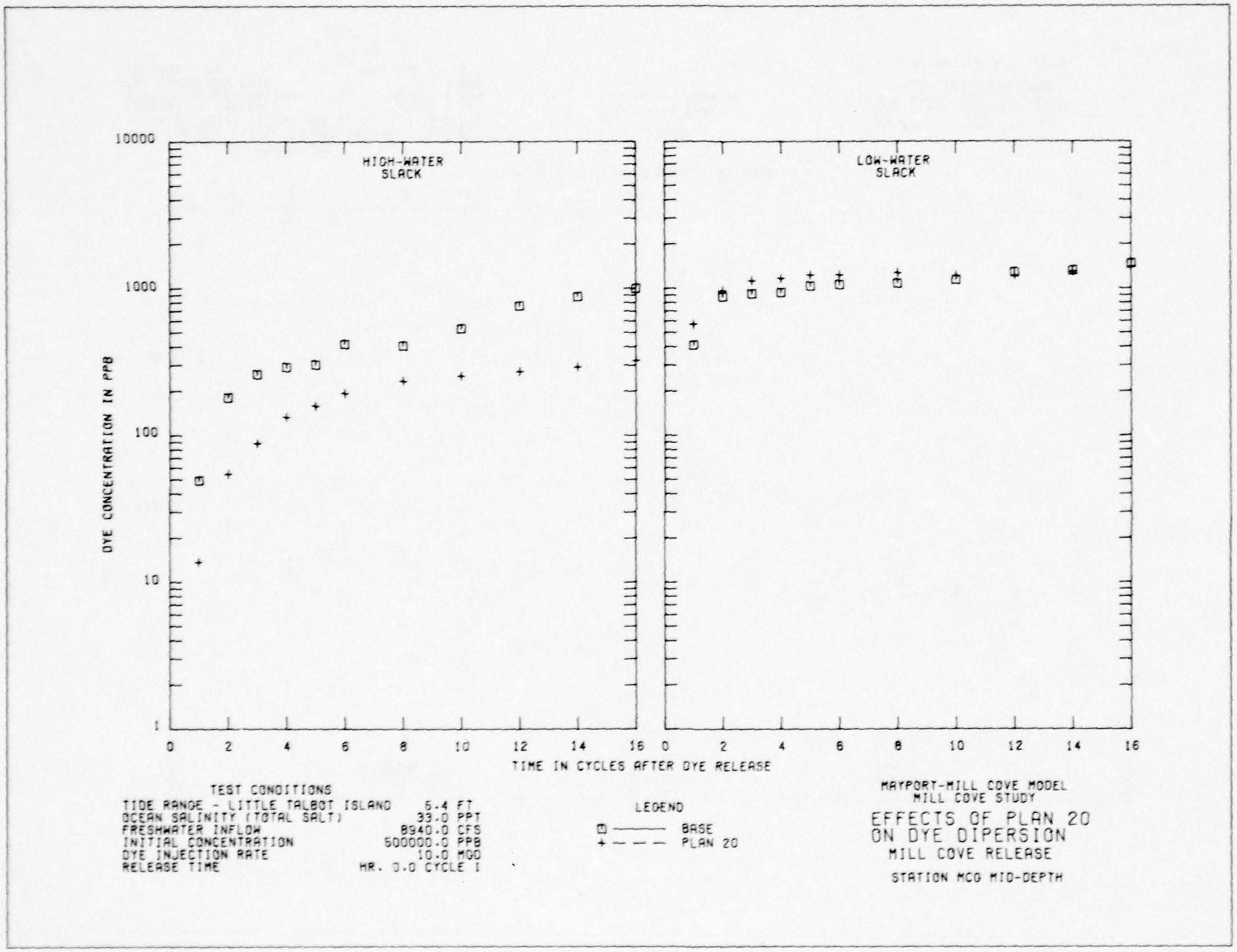

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE I
LEGEND
BASE
PLAN 20
MAYPORT-MILL COVE MODEL
MILL COVE STUDY
EFFECTS OF PLAN 20
ON DYE DIPERSION
MILL COVE RELEASE
STATION MCG MID-DEPTH

PLATE 149

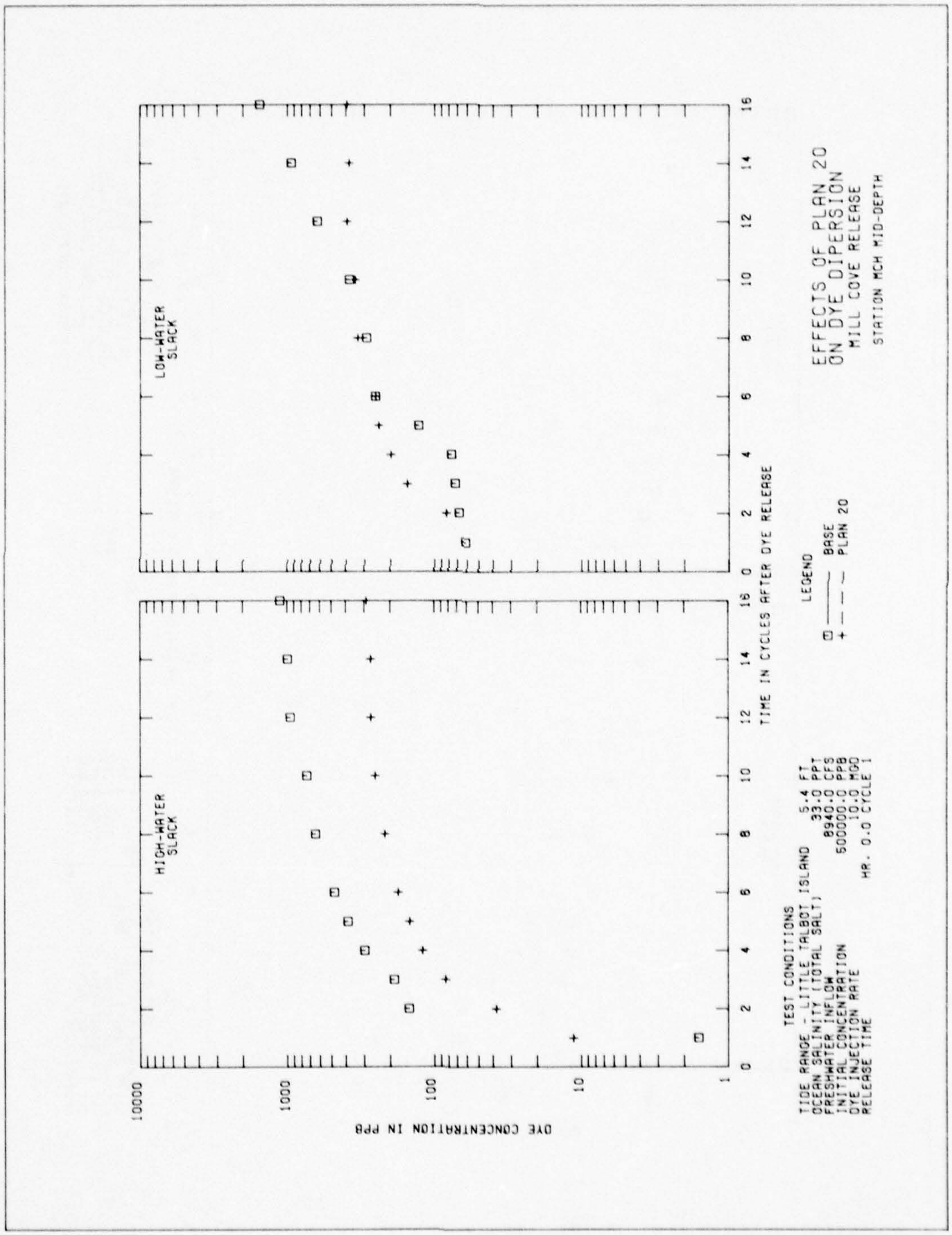
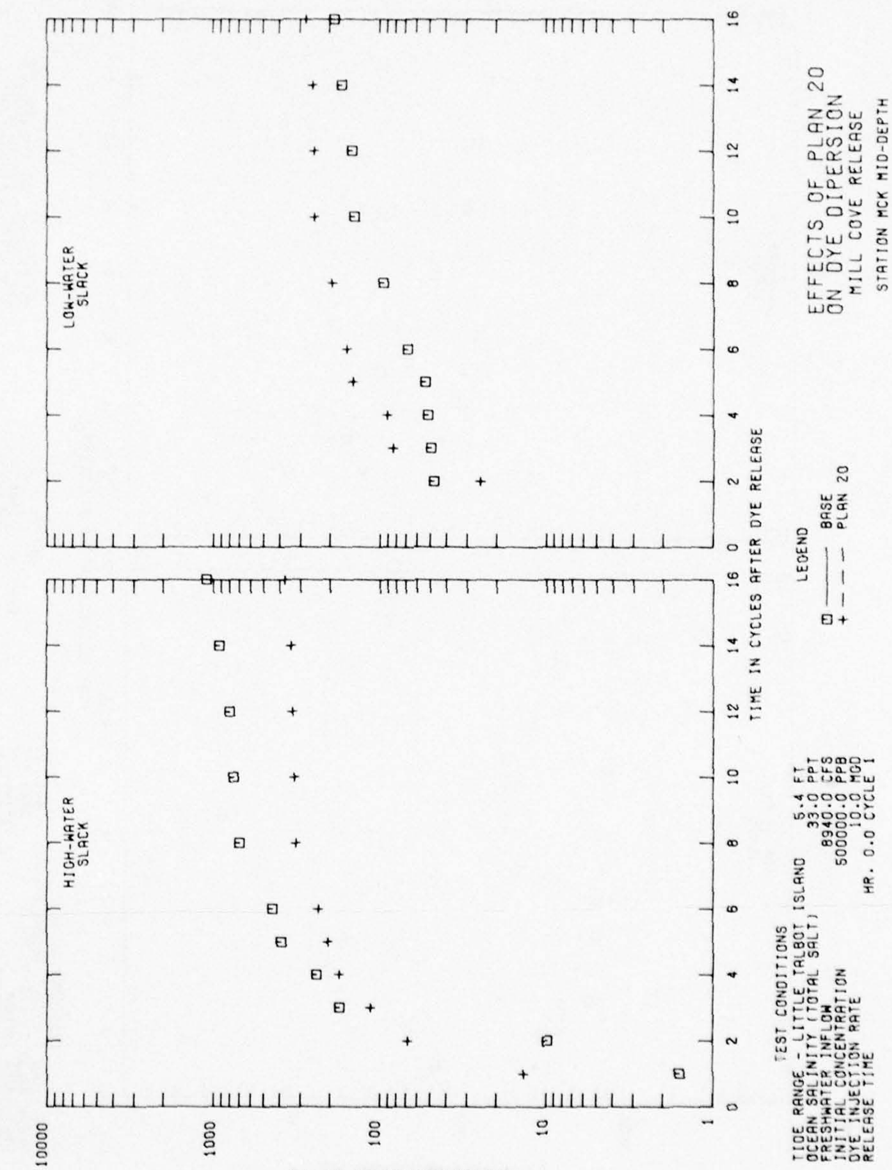
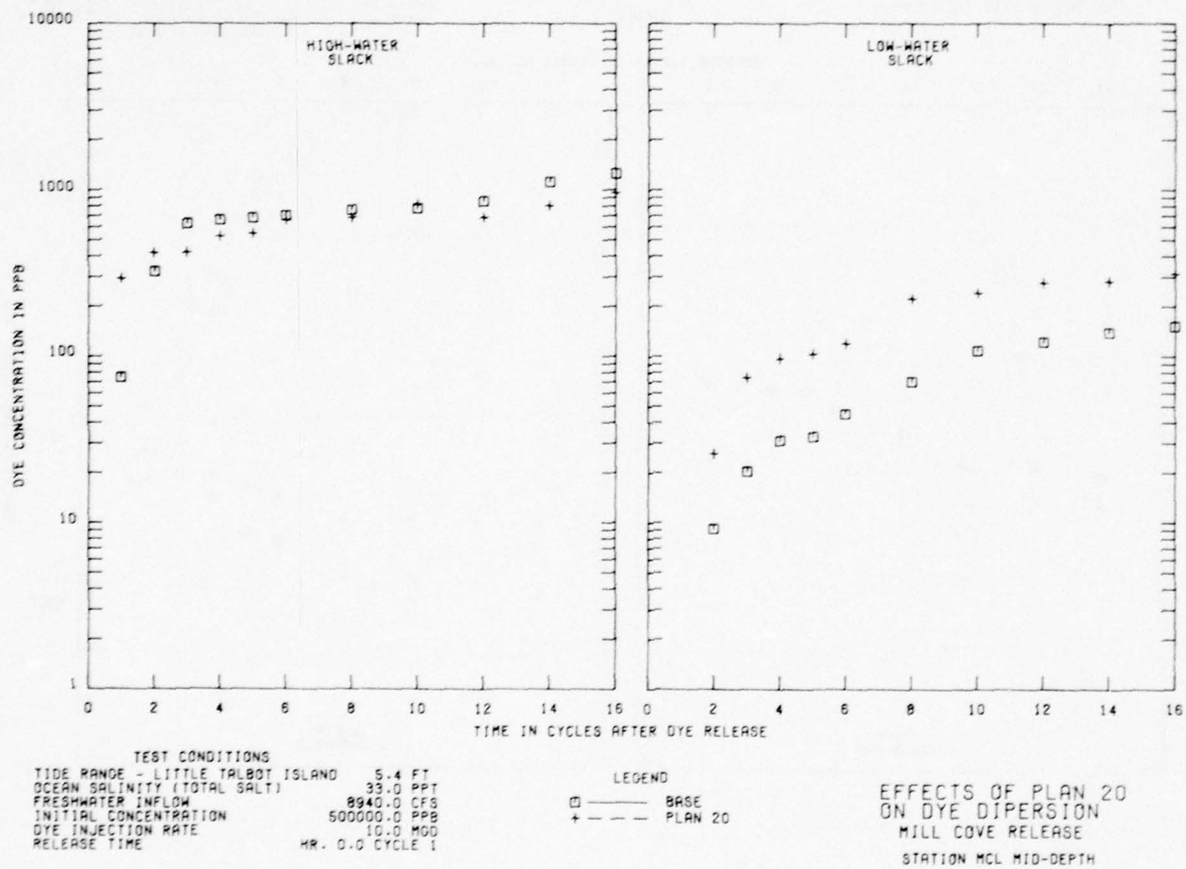

DYE CONCENTRATION IN PPB
10000
1000
100
10
1
HIGH-WATER SLACK
LOW-WATER SLACK
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE -- LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
BASE
PLAN 20
EFFECTS OF PLAN 20
ON DYE DIPERSION
MILL COVE RELEASE
STATION MCH MID-DEPTH

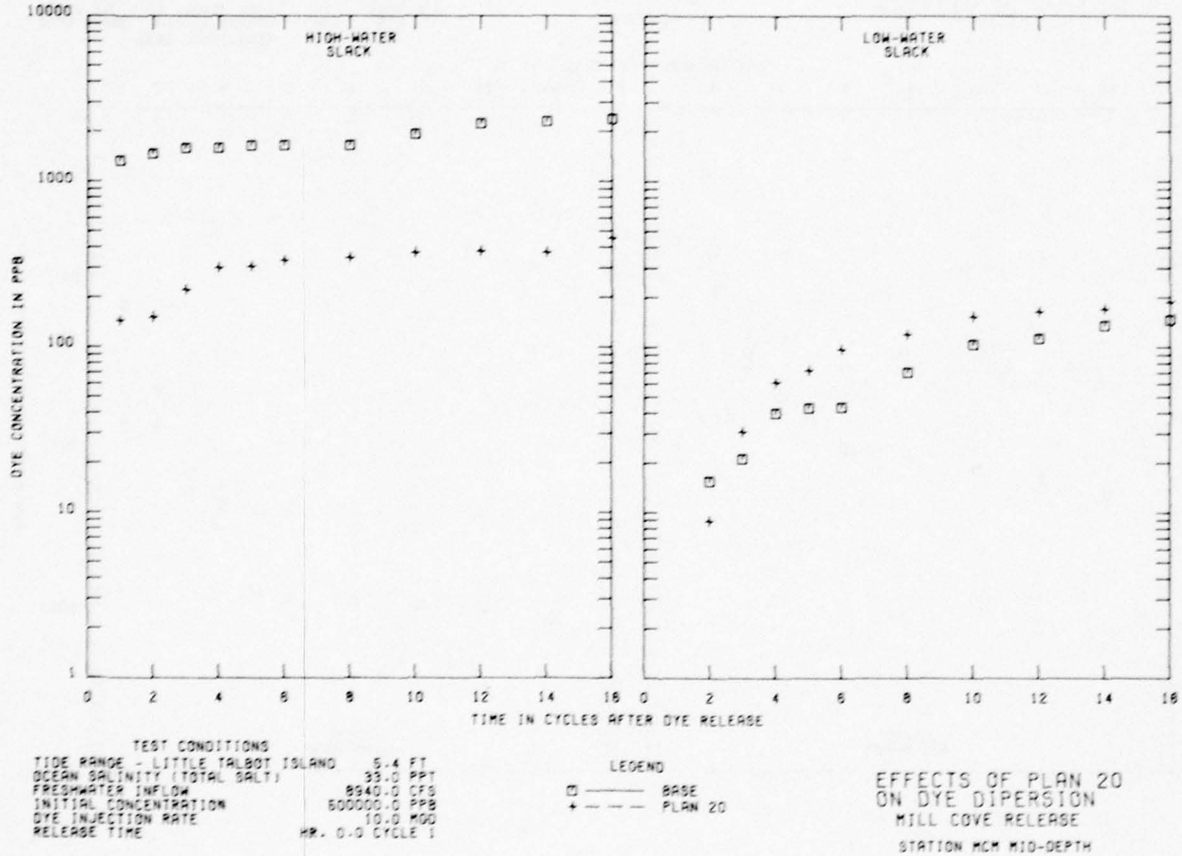
PLATE 150



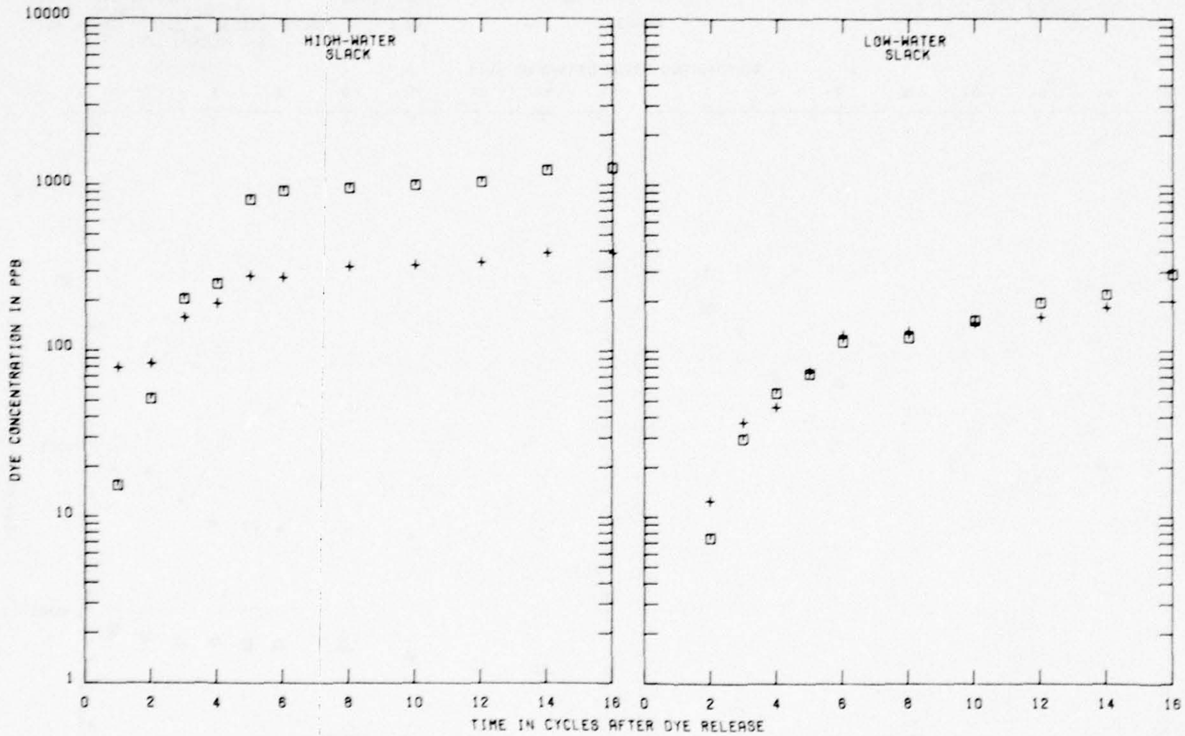
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
HIGH-WATER SLACK
LOW-WATER SLACK
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
BASE
PLAN 20
EFFECTS OF PLAN 20
ON DYE DIPERSION
MILL COVE RELEASE
STATION MCK MID-DEPTH

PLATE 151


HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0 2 4 6 8 10 12 14 16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
BASE
PLAN 20
EFFECTS OF PLAN 20
ON DYE DIPERSION
MILL COVE RELEASE
STATION MCL MID-DEPTH



HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0 2 4 6 8 10 12 14 16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
BASE
PLAN 20
EFFECTS OF PLAN 20
ON DYE DIPERSION
MILL COVE RELEASE
STATION MCM MID-DEPTH



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	600000.0 PPB
DYE INJECTION RATE	10.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

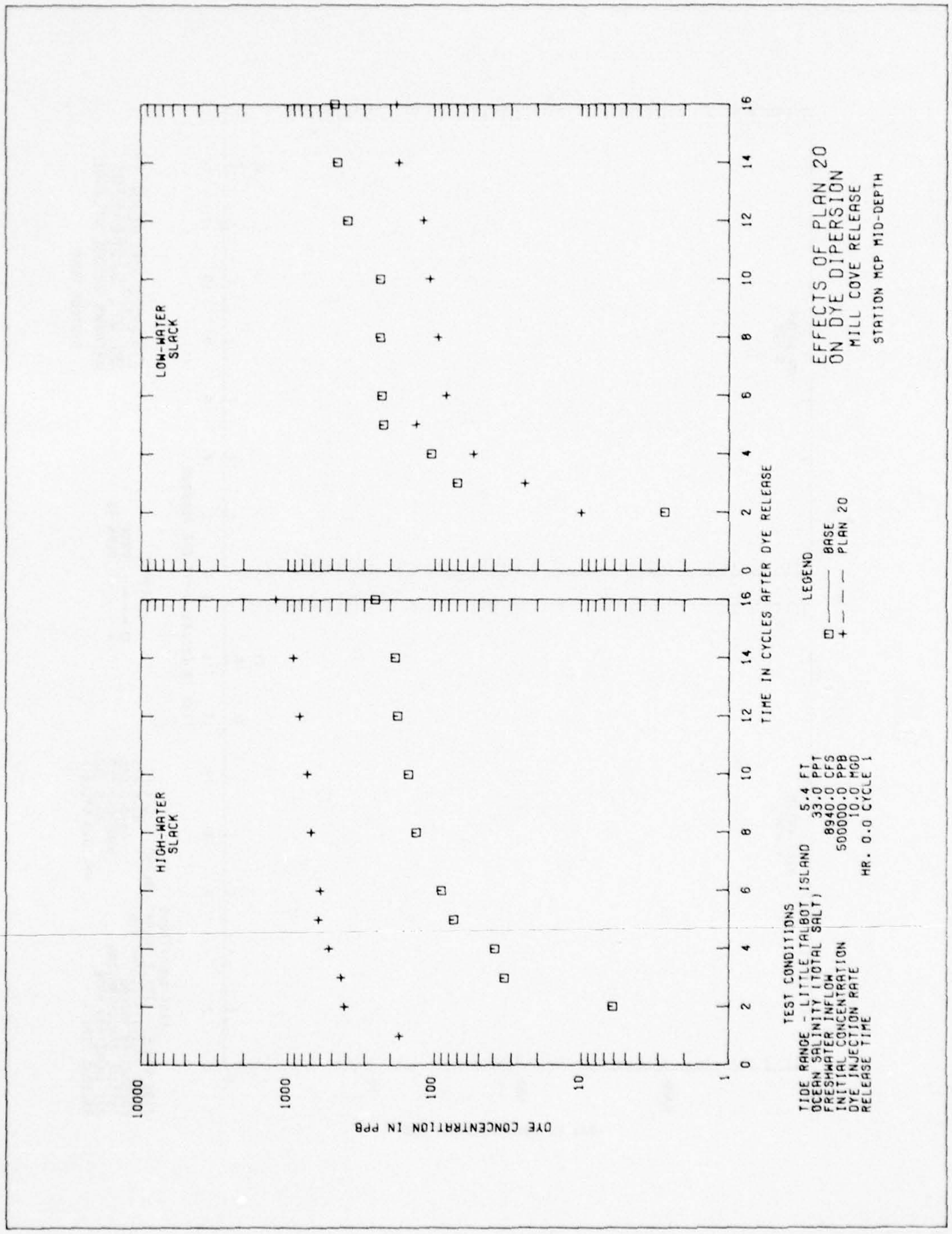
LEGEND

□ ——— BASE
+ — — — PLAN 20

EFFECTS OF PLAN 20
ON DYE DIPERSION
MILL COVE RELEASE

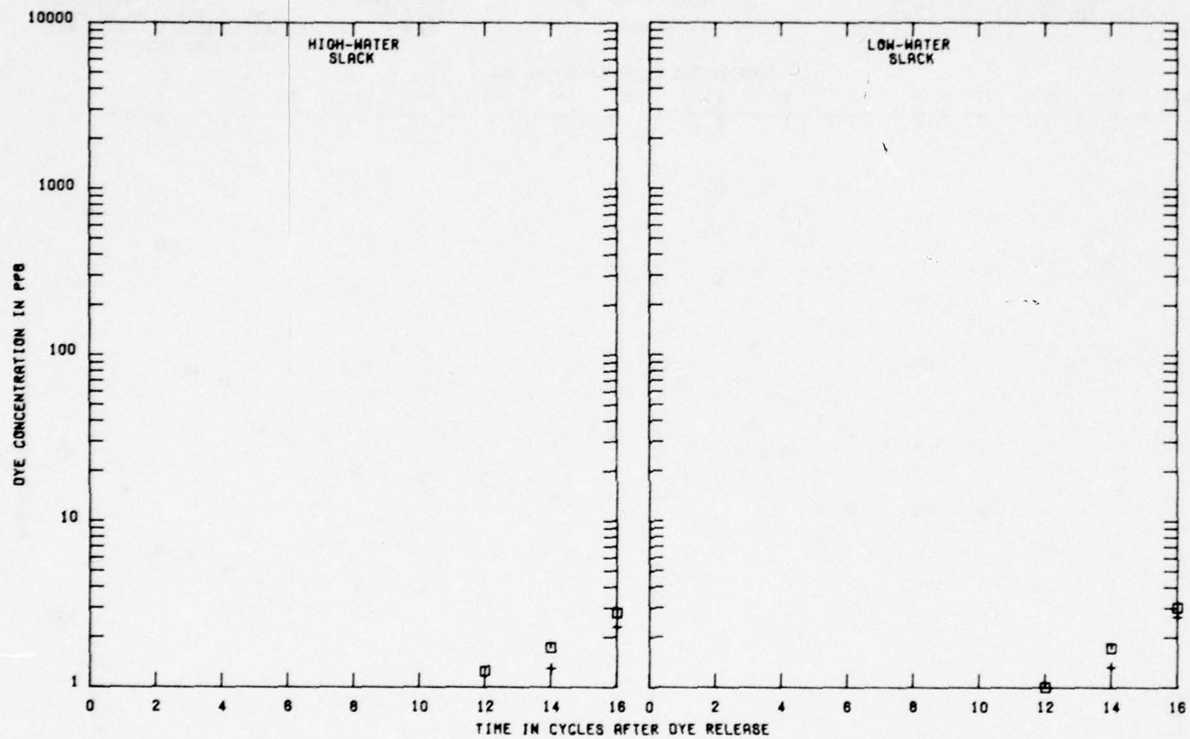
STATION MCN MID-DEPTH

PLATE 154



EFFECTS OF PLAN 20
ON DYE DIPERSION
MILL COVE RELEASE
STATION MCP MID-DEPTH
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
LEGEND
BASE
PLAN 20
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 10.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1

PLATE 155



TEST CONDITIONS

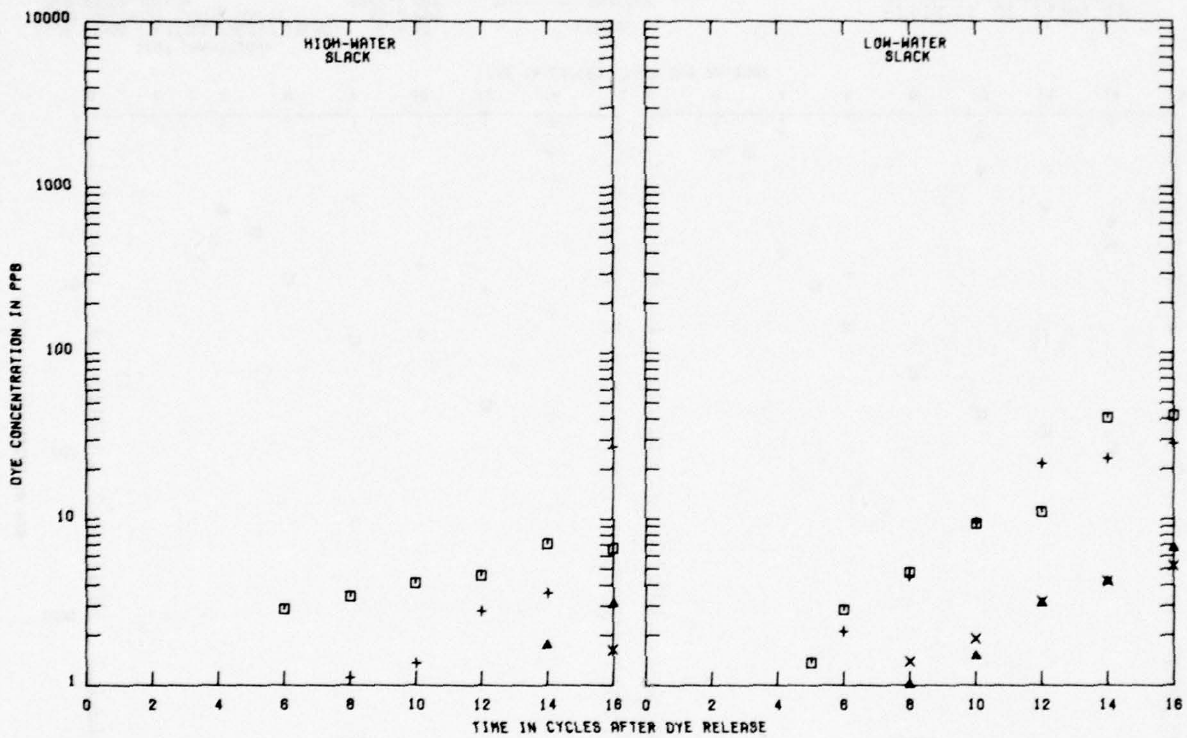
TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	20.0 MOD
RELEASE TIME - -	HR. 0.0 CYCLE 1

LEGEND

□ ——— BASE
+ — — — PLAN 15

EFFECTS OF PLAN 15
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE

STATION SUMP



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	600000.0 PPB
DYE INJECTION RATE	20.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

⊡ ———	SURFACE	BASE
▲ — — —	BOTTOM	
+ —·—·—	SURFACE	PLAN 15
× —··—··—	BOTTOM	

EFFECTS OF PLAN 15
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE

STATION OCEAN

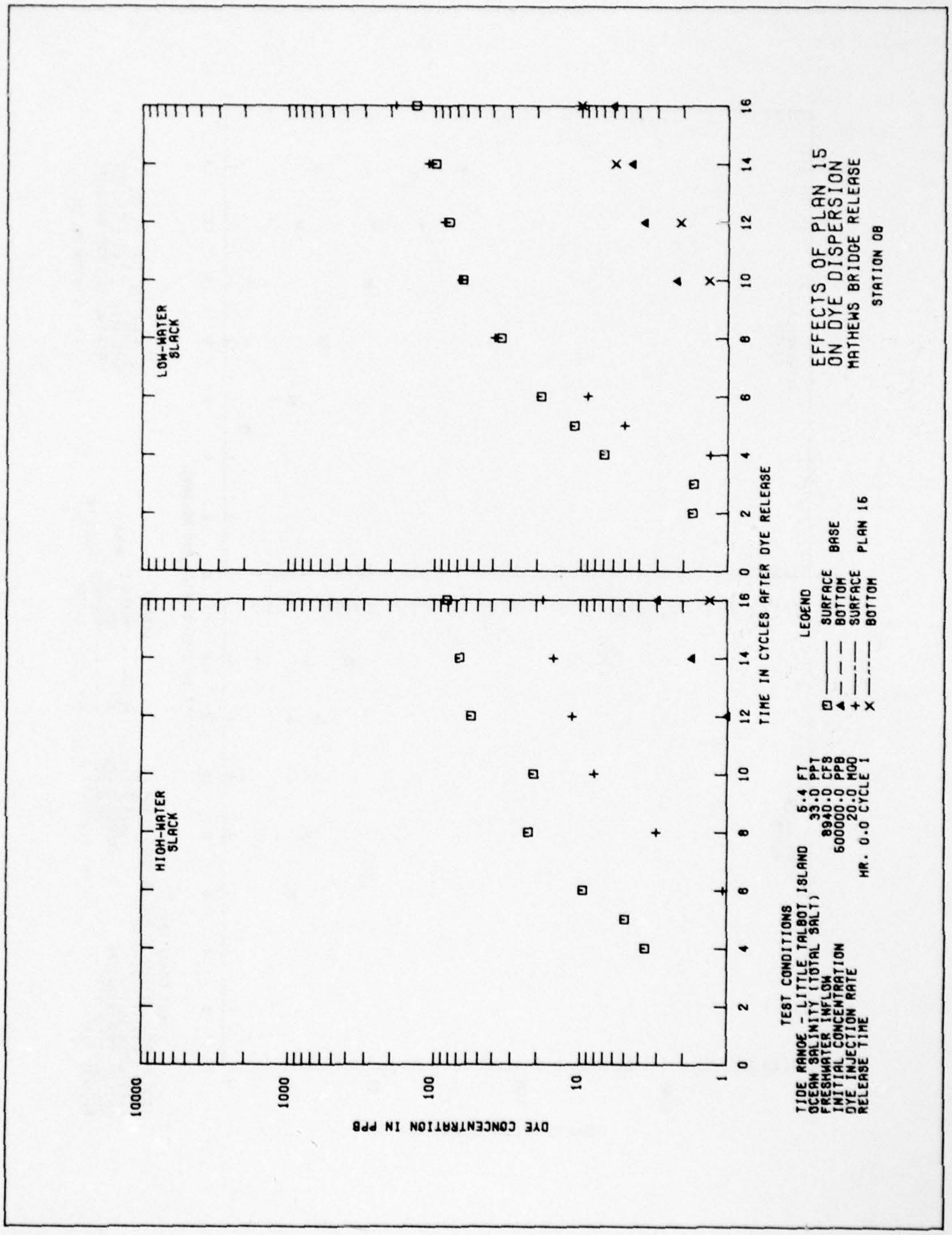
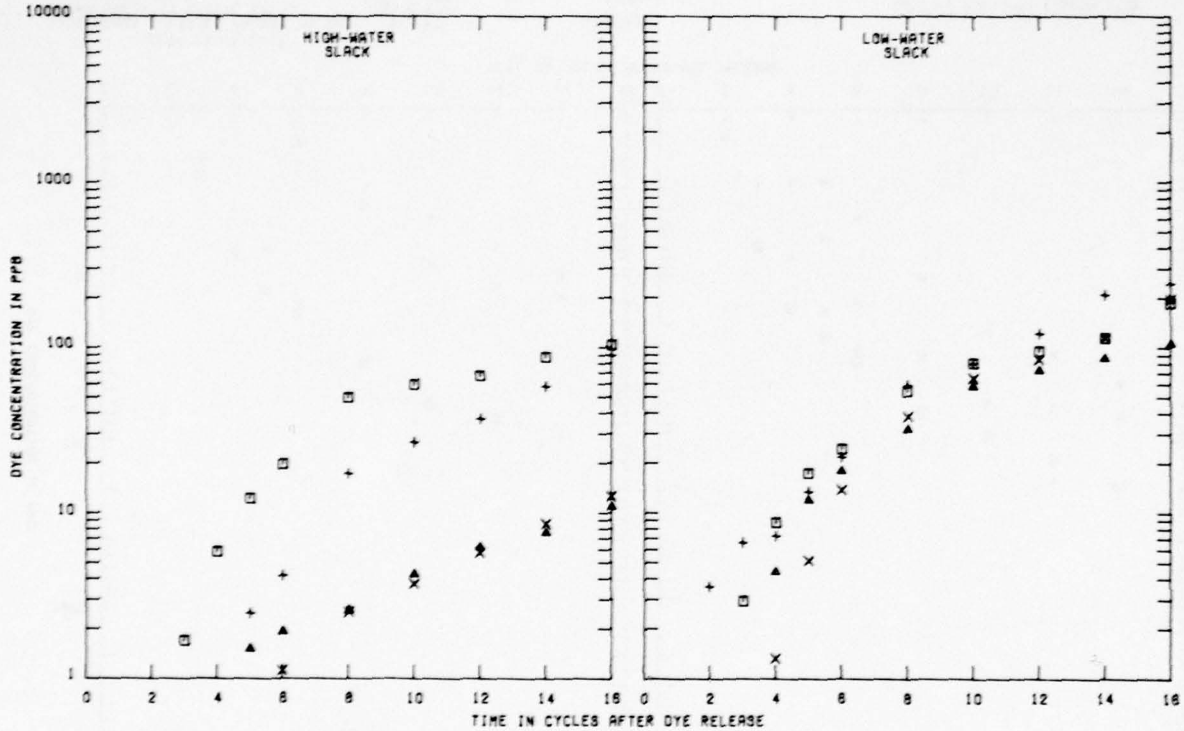

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE BASE
BOTTOM
SURFACE PLAN 16
BOTTOM
EFFECTS OF PLAN 15
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION 08

PLATE 158



TEST CONDITIONS

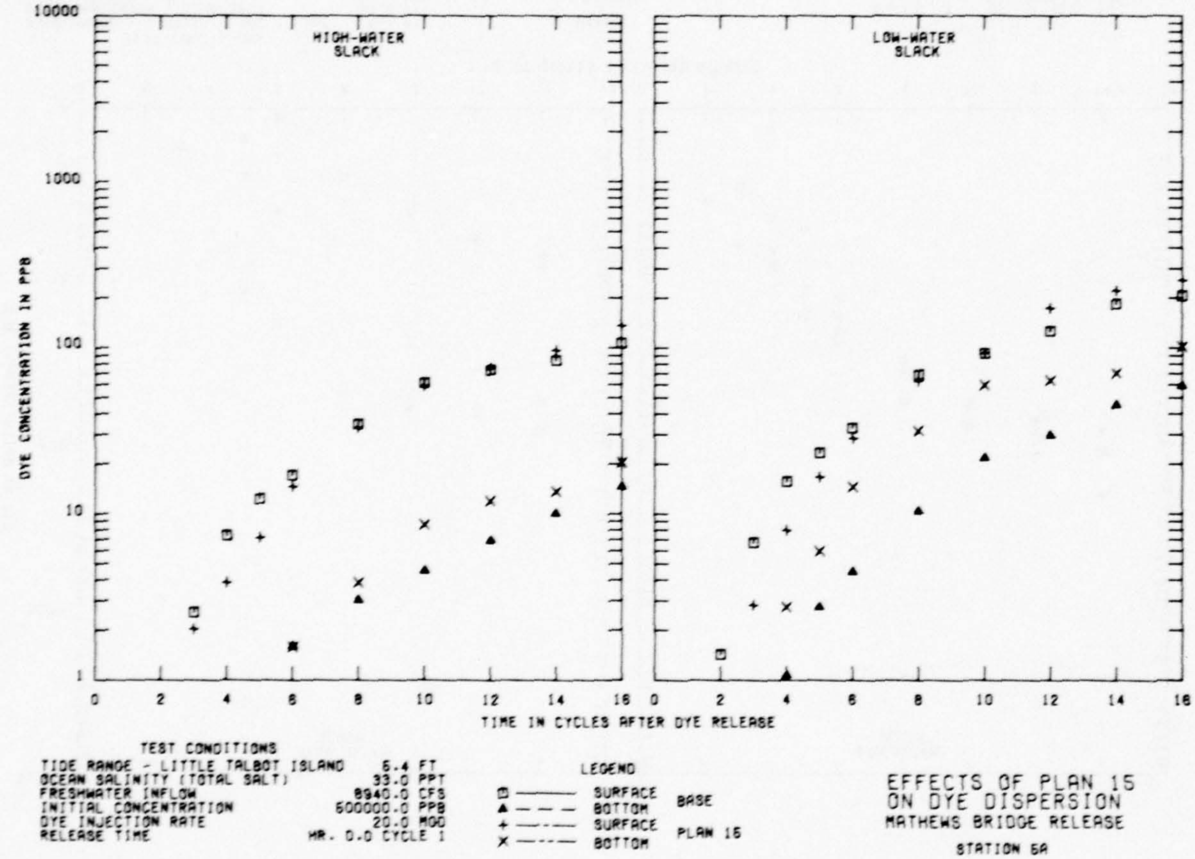
TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	20.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

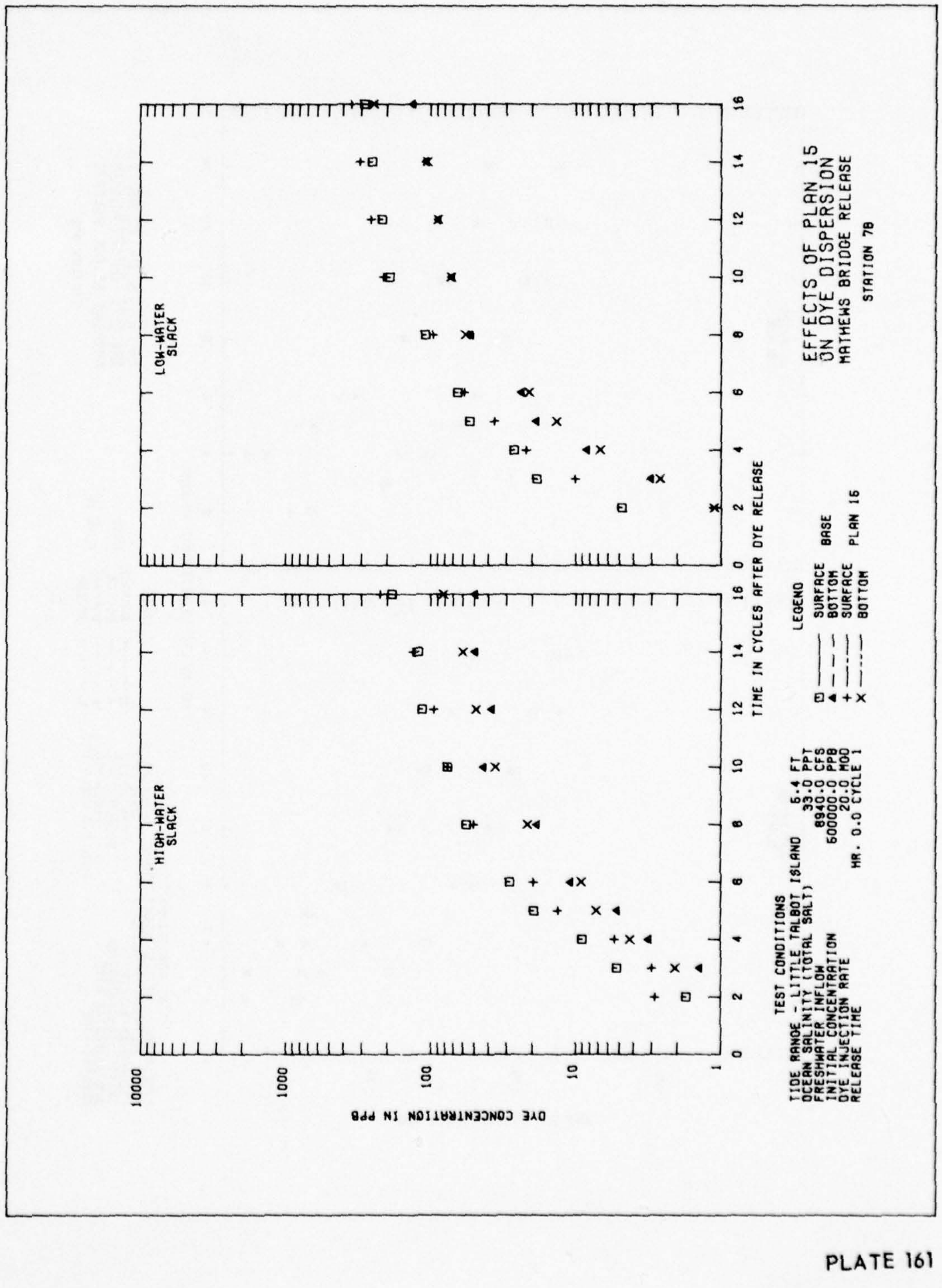
LEGEND

⊡ ———	SURFACE	BASE
▲ — — —	BOTTOM	
+ —·—·—	SURFACE	PLAN 15
× —··—··	BOTTOM	

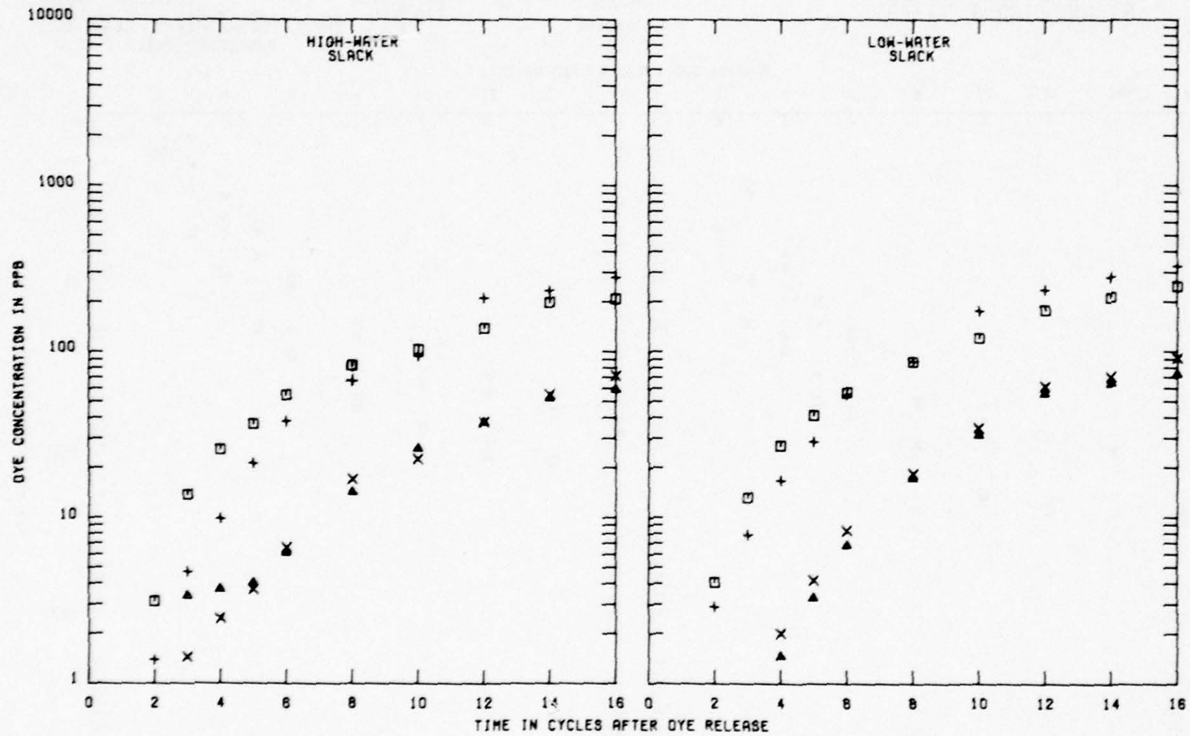
EFFECTS OF PLAN 15
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE

STATION 3A


HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0 2 4 6 8 10 12 14 16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 15
EFFECTS OF PLAN 15
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION 5A



EFFECTS OF PLAN 15
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION 7B
HIGH-WATER
SLACK
LOW-WATER
SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 15
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MOD
RELEASE TIME HR. 0.0 CYCLE 1



TEST CONDITIONS

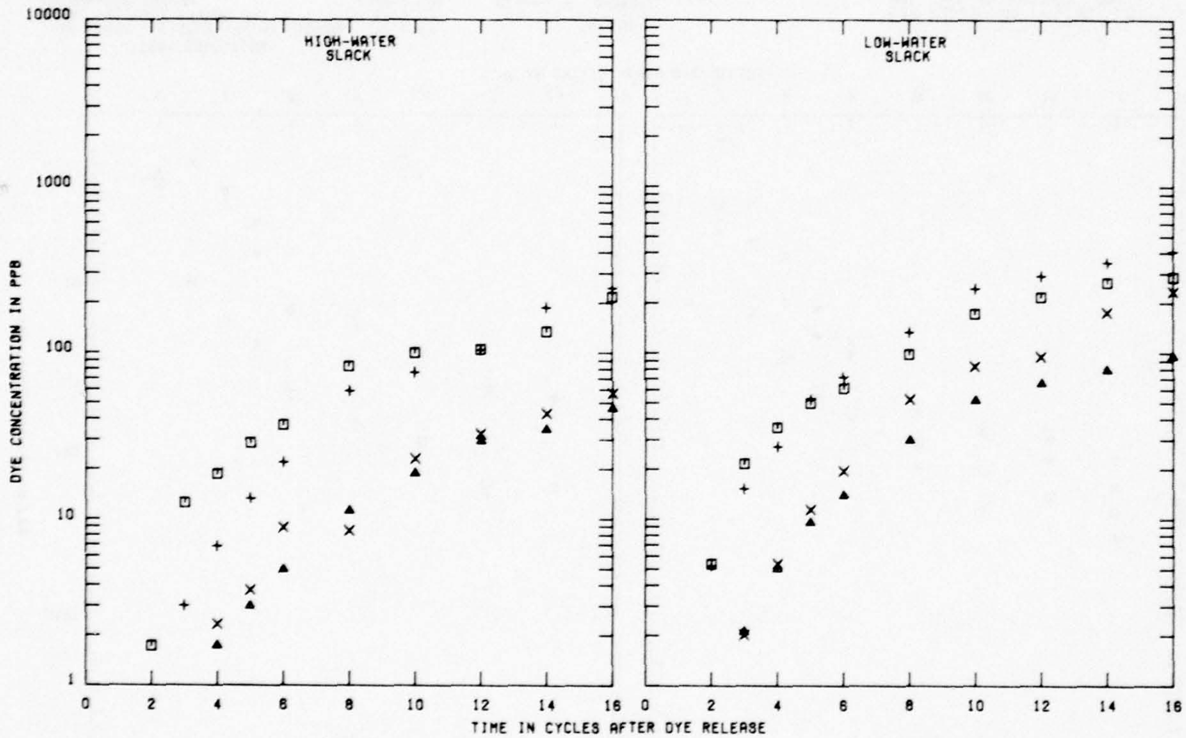
TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	20.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

⊡ ———	SURFACE	BASE
▲ — — —	BOTTOM	
+ —·—	SURFACE	PLAN 15
× —··—	BOTTOM	

EFFECTS OF PLAN 15
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE

STATION 9A8



TEST CONDITIONS

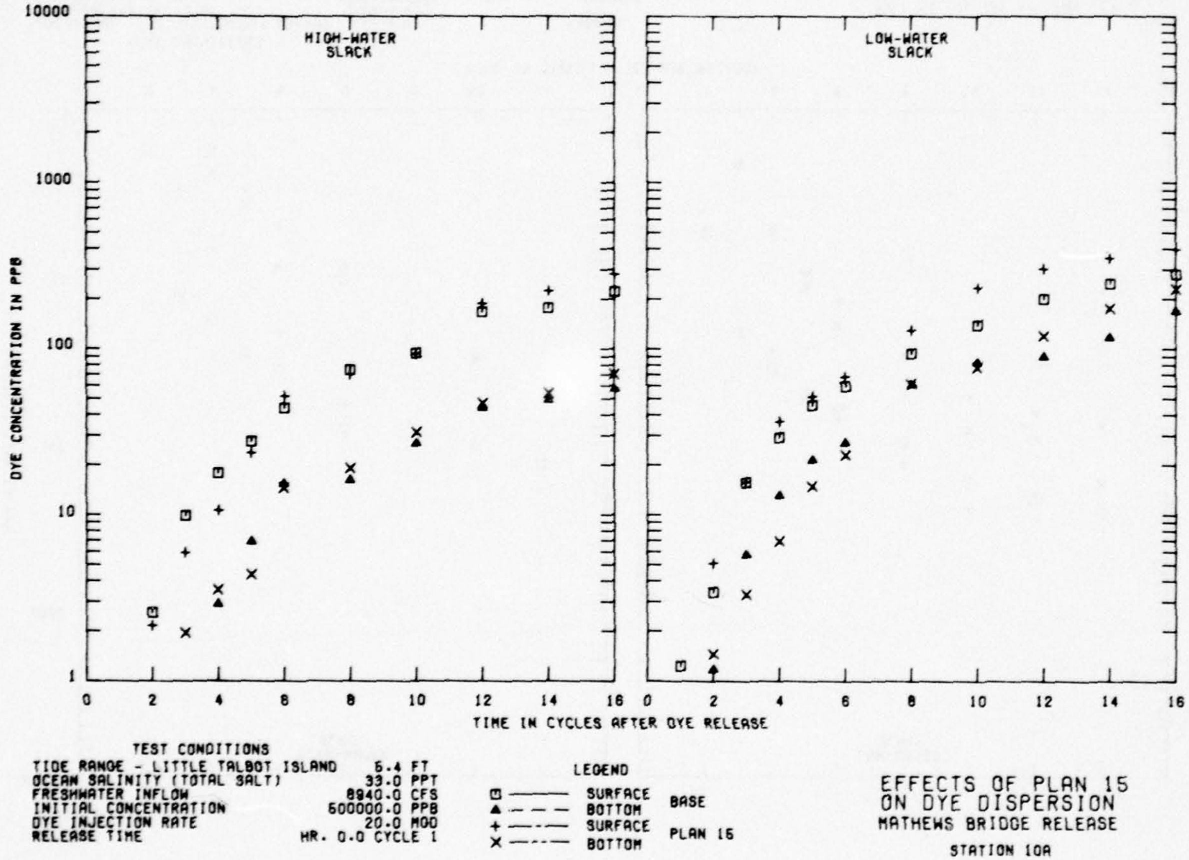
TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	20.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

⊡ ————	SURFACE	BASE
▲ — — —	BOTTOM	
+ —·—·—	SURFACE	PLAN 15
× —··—··	BOTTOM	

EFFECTS OF PLAN 15
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE

STATION 98



EFFECTS OF PLAN 15
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE

STATION 10A

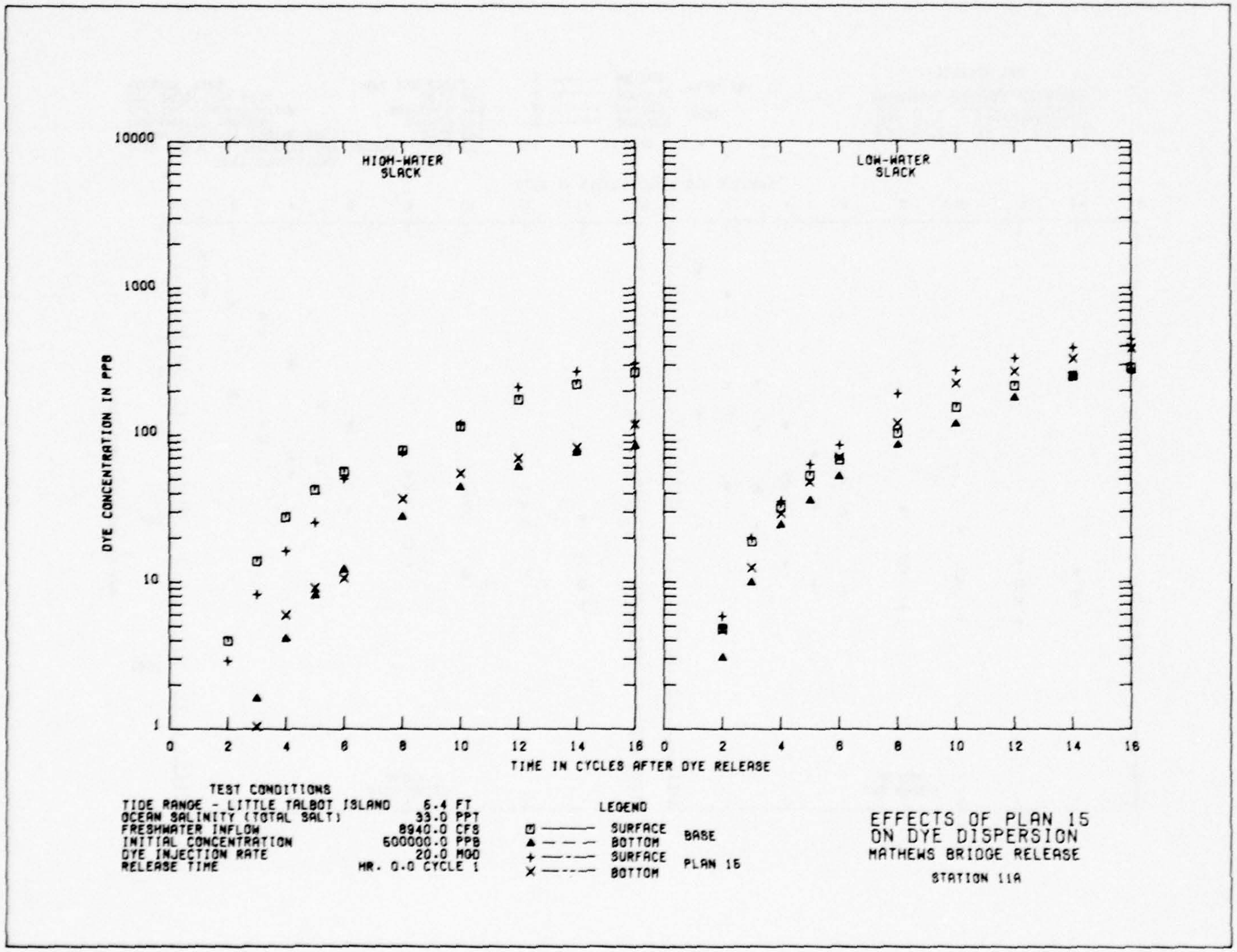
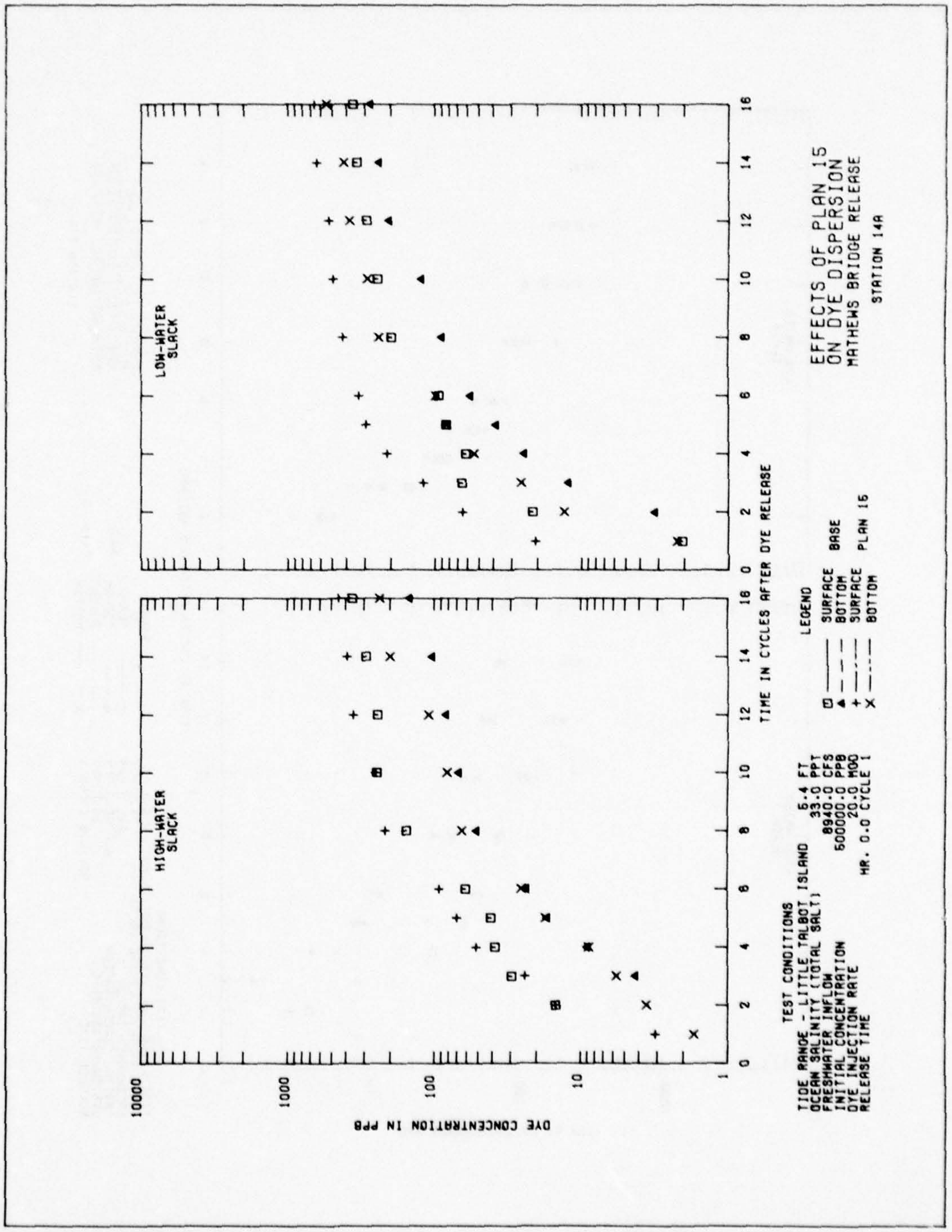

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 6.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 15
EFFECTS OF PLAN 15
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION 11A

PLATE 165


EFFECTS OF PLAN 15
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION 14A
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MOO
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE BASE
BOTTOM
SURFACE PLAN 15
BOTTOM

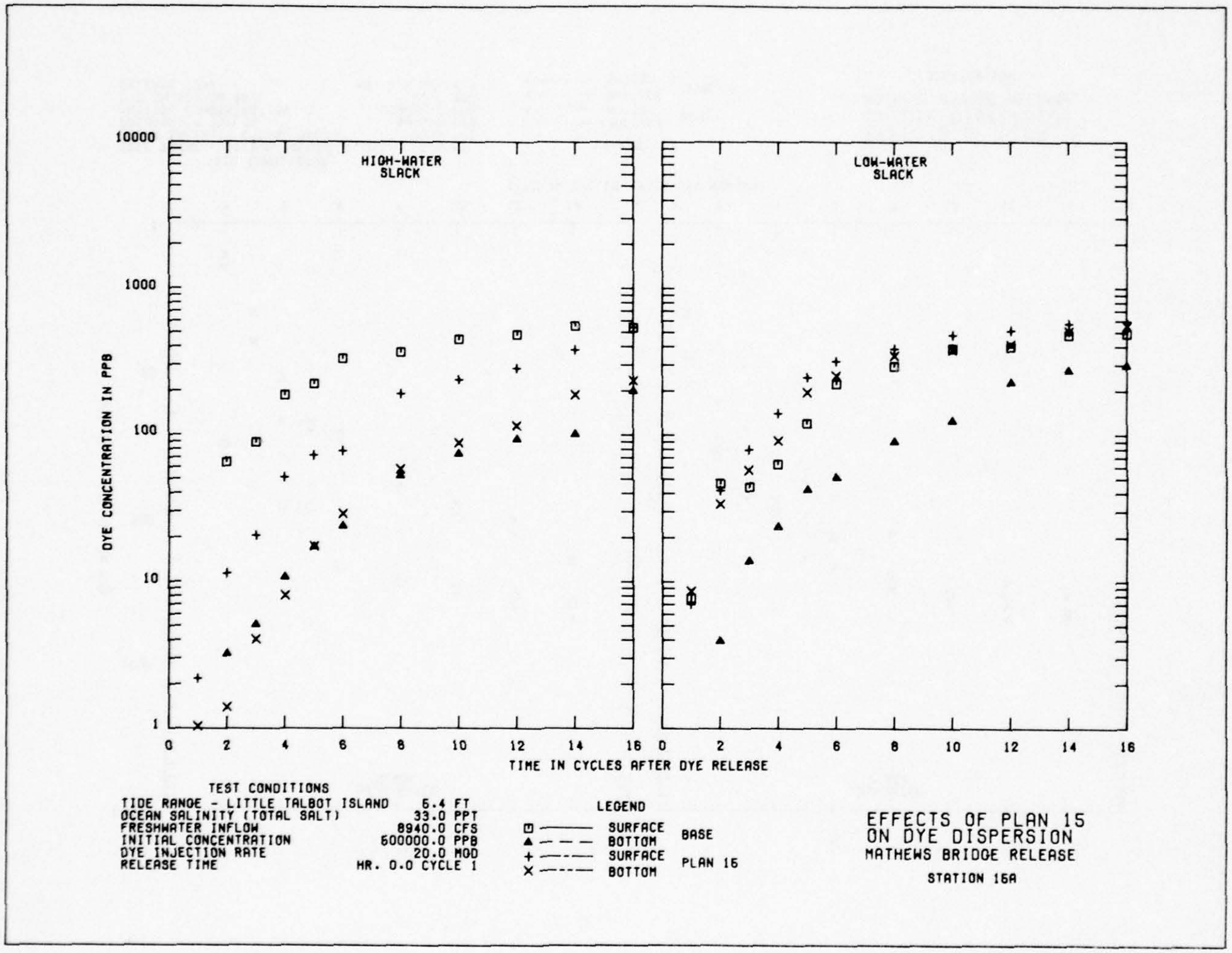
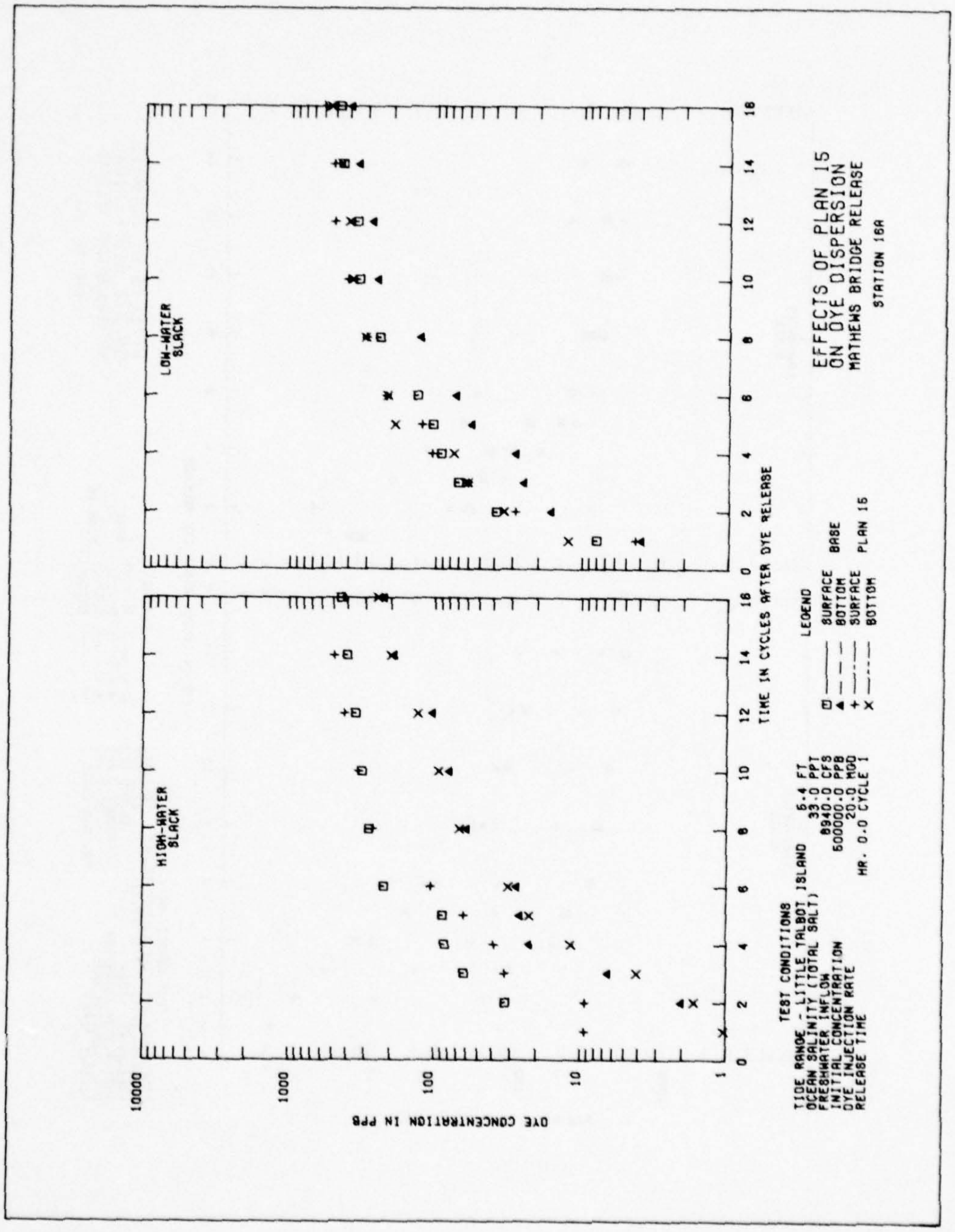
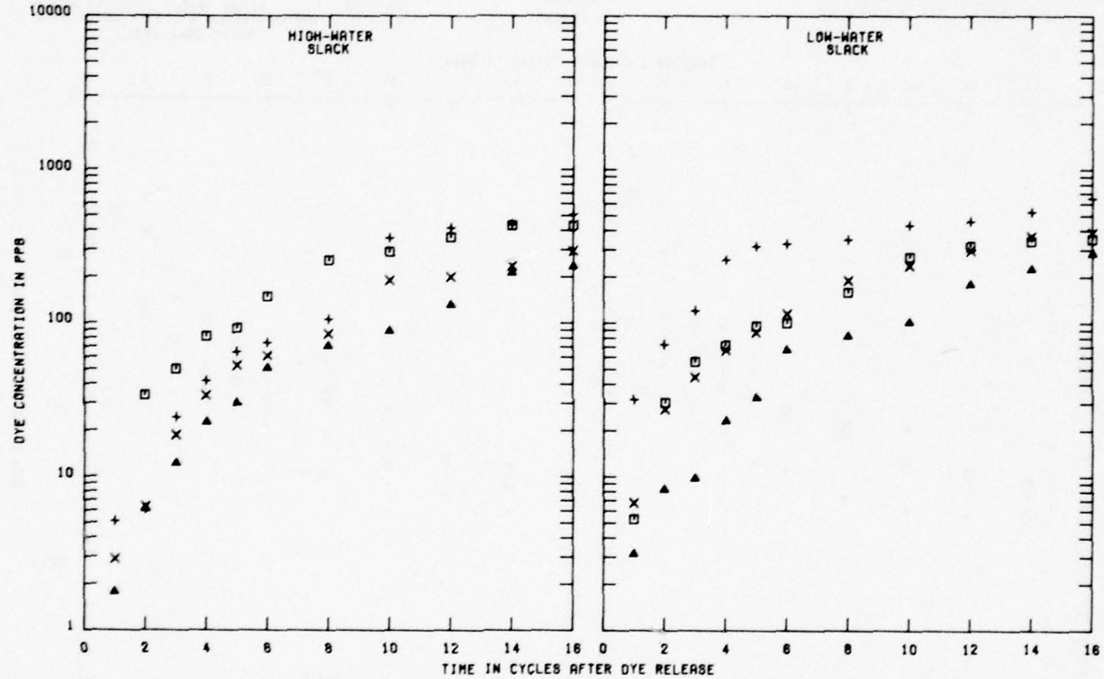

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 6.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 20.0 MOD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 15
EFFECTS OF PLAN 15
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION 16A

PLATE 167



EFFECTS OF PLAN 15
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION 16A
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE BASE
BOTTOM
SURFACE PLAN 15
BOTTOM

PLATE 168



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8840.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	20.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

⊡ ———	SURFACE	BASE
▲ — — —	BOTTOM	
+ —·—	SURFACE	PLAN 15
× —··—	BOTTOM	

EFFECTS OF PLAN 15
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE

STATION 17A

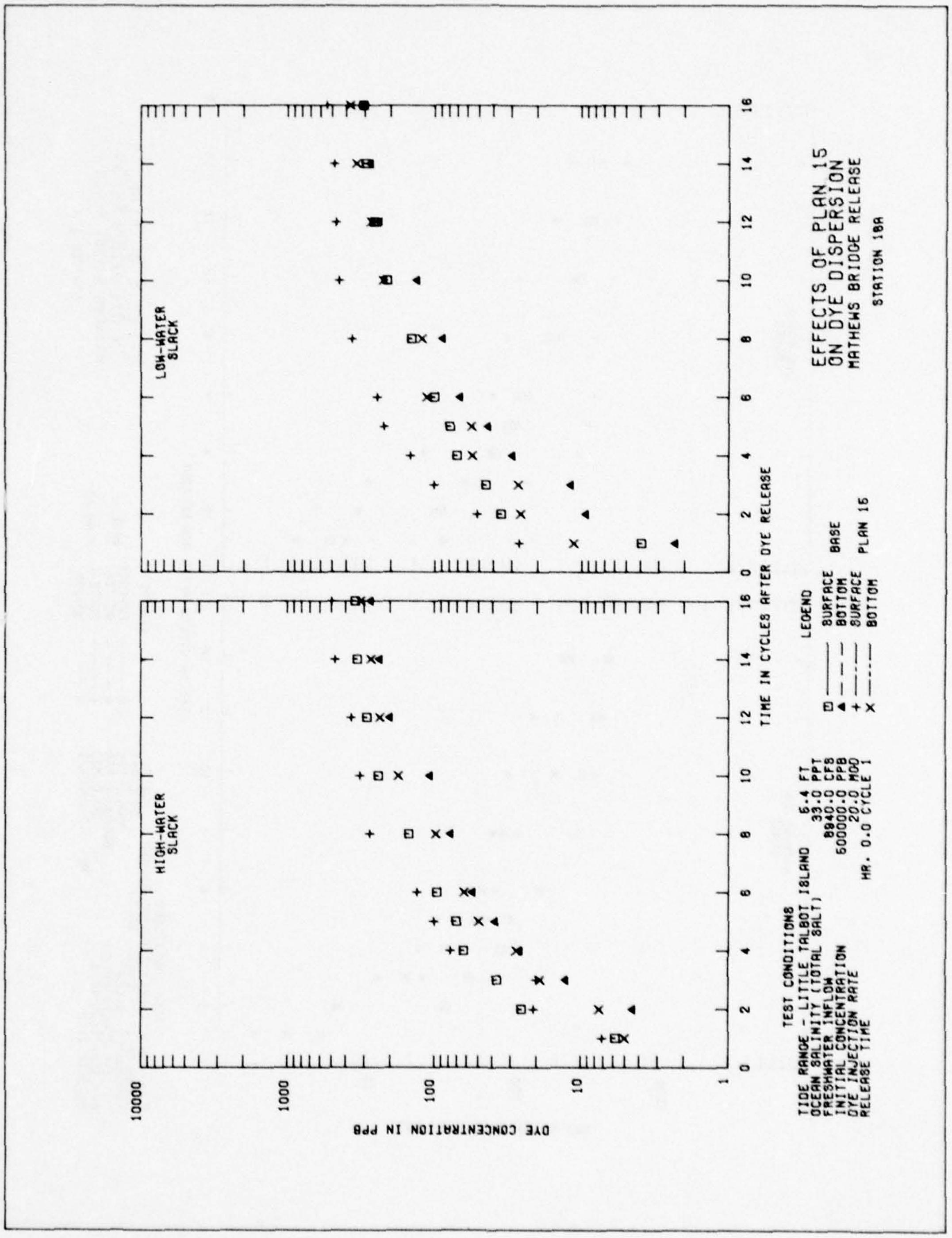
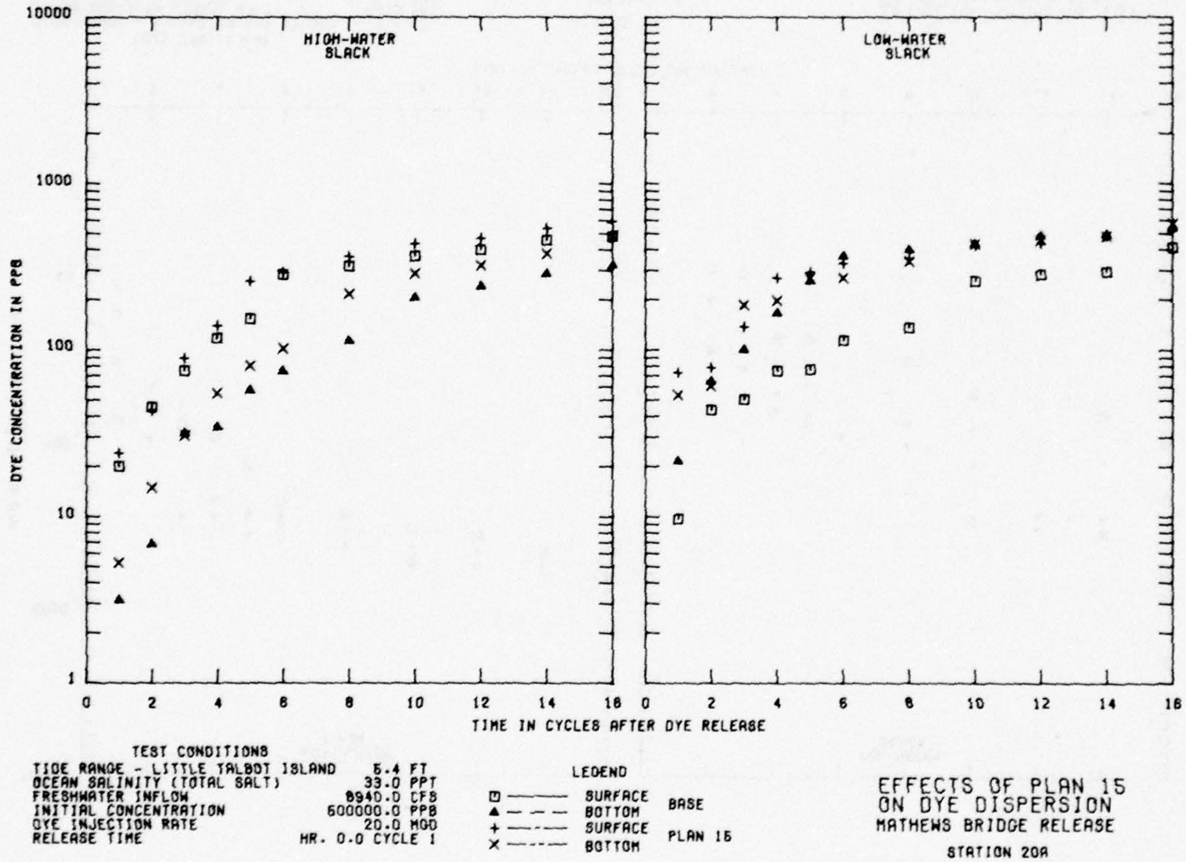

EFFECTS OF PLAN 15
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION 18A
HIGH-WATER
SLACK
LOW-WATER
SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
TIME IN CYCLES AFTER DYE RELEASE
0
2
4
6
8
10
12
14
16
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 6.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 15

PLATE 170



HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0 2 4 6 8 10 12 14 16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 15
EFFECTS OF PLAN 15
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION 20A

PLATE 171

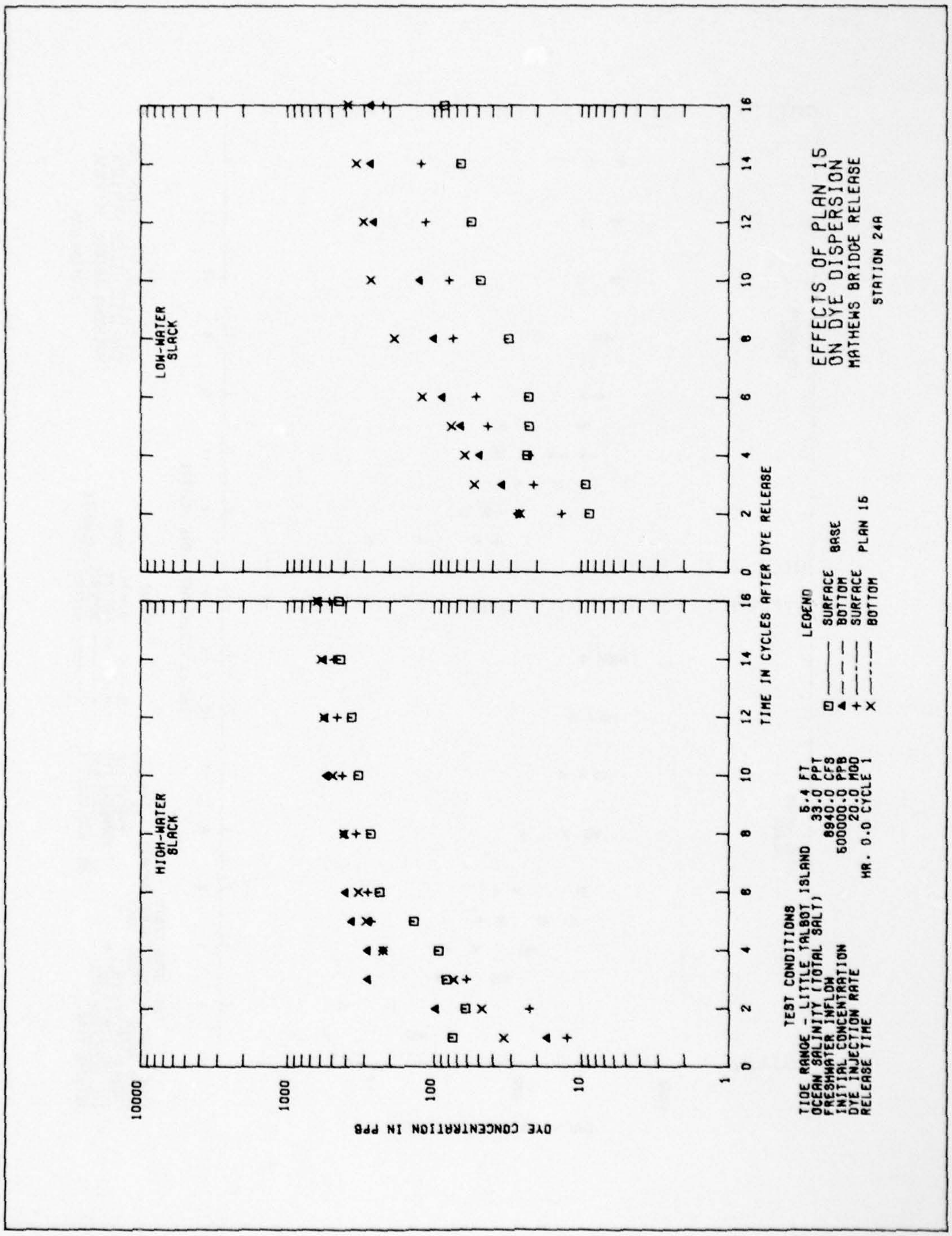
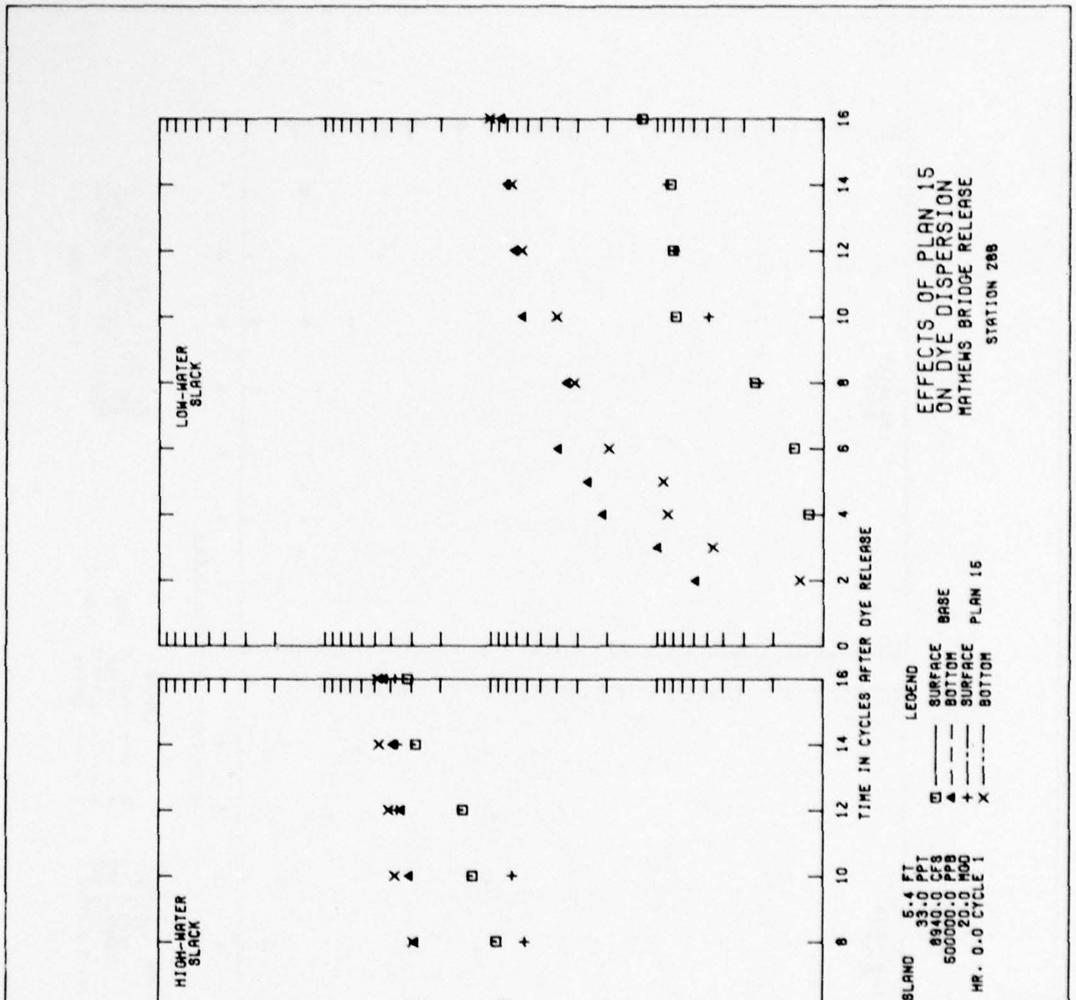
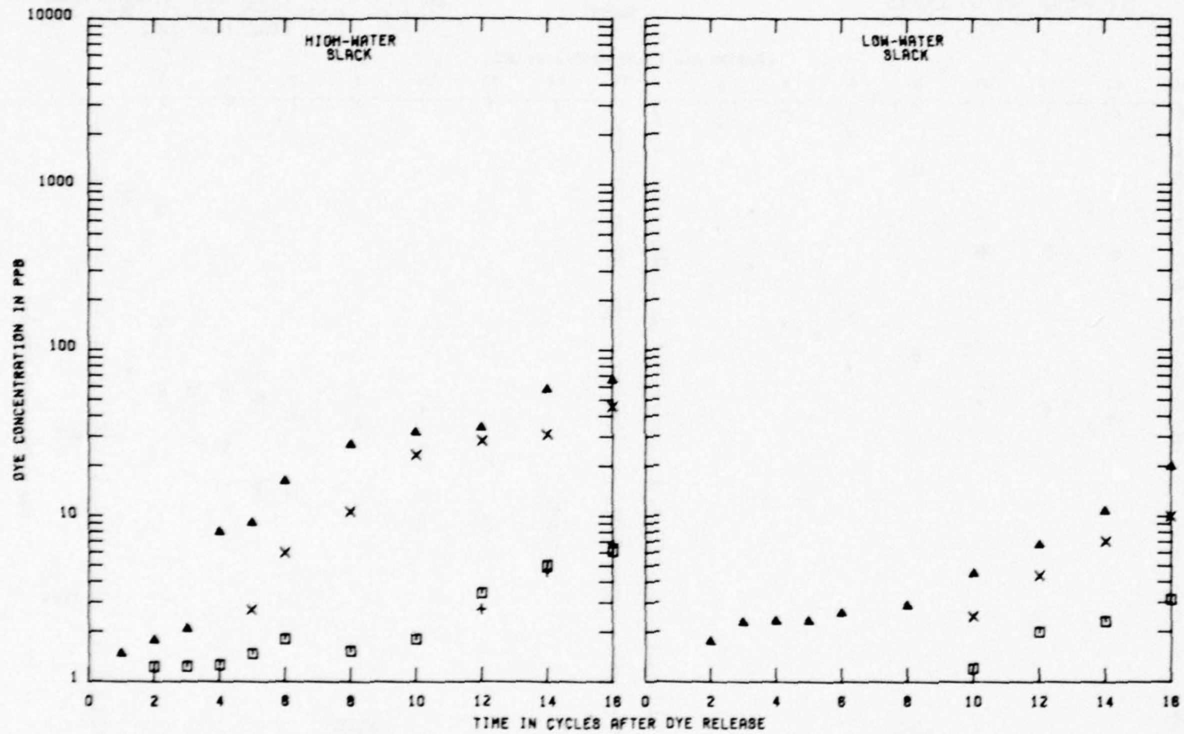

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 20.0 MOD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 15
EFFECTS OF PLAN 15
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION 24A

PLATE 172



HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE BASE
BOTTOM
SURFACE PLAN 15
BOTTOM
EFFECTS OF PLAN 15
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION 288

PLATE 173



TEST CONDITIONS

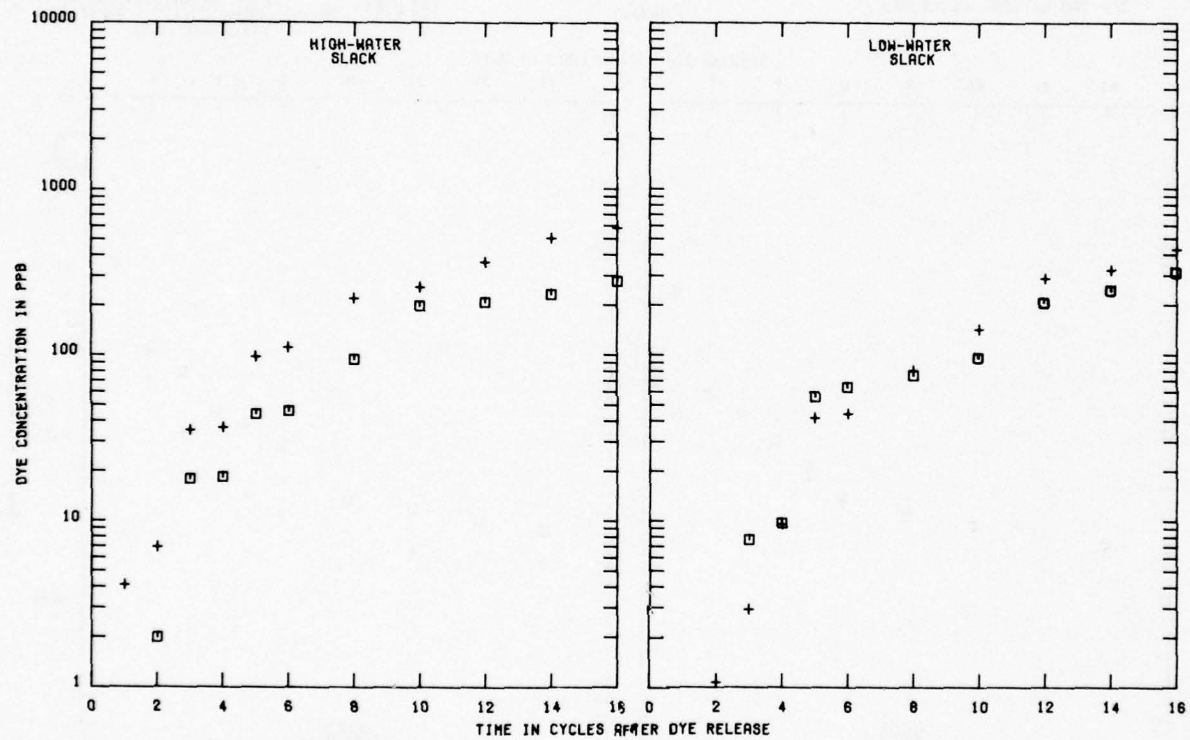
TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	20.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

- ⊡ ——— SURFACE — BASE
- ▲ — — — BOTTOM — BASE
- + —·—·— SURFACE — PLAN 15
- × —··— BOTTOM — PLAN 15

EFFECTS OF PLAN 15
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE

STATION 33A



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	20.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

⊡ ——— BASE
+ — — — PLAN 15

EFFECTS OF PLAN 15
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE

STATION BRR MID-DEPTH

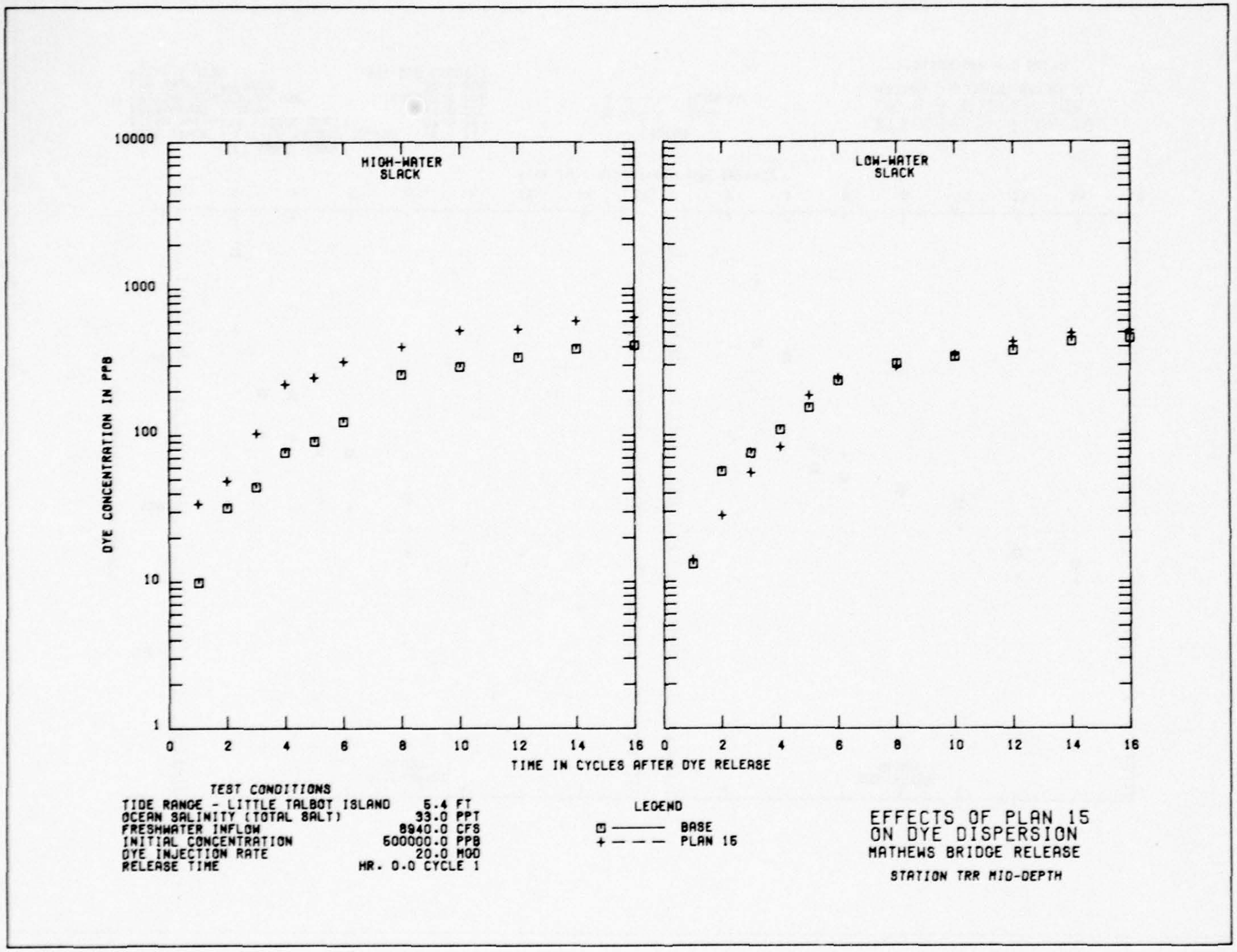

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0 2 4 6 8 10 12 14 16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
BASE
PLAN 15
EFFECTS OF PLAN 15
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION TRR MID-DEPTH

PLATE 176

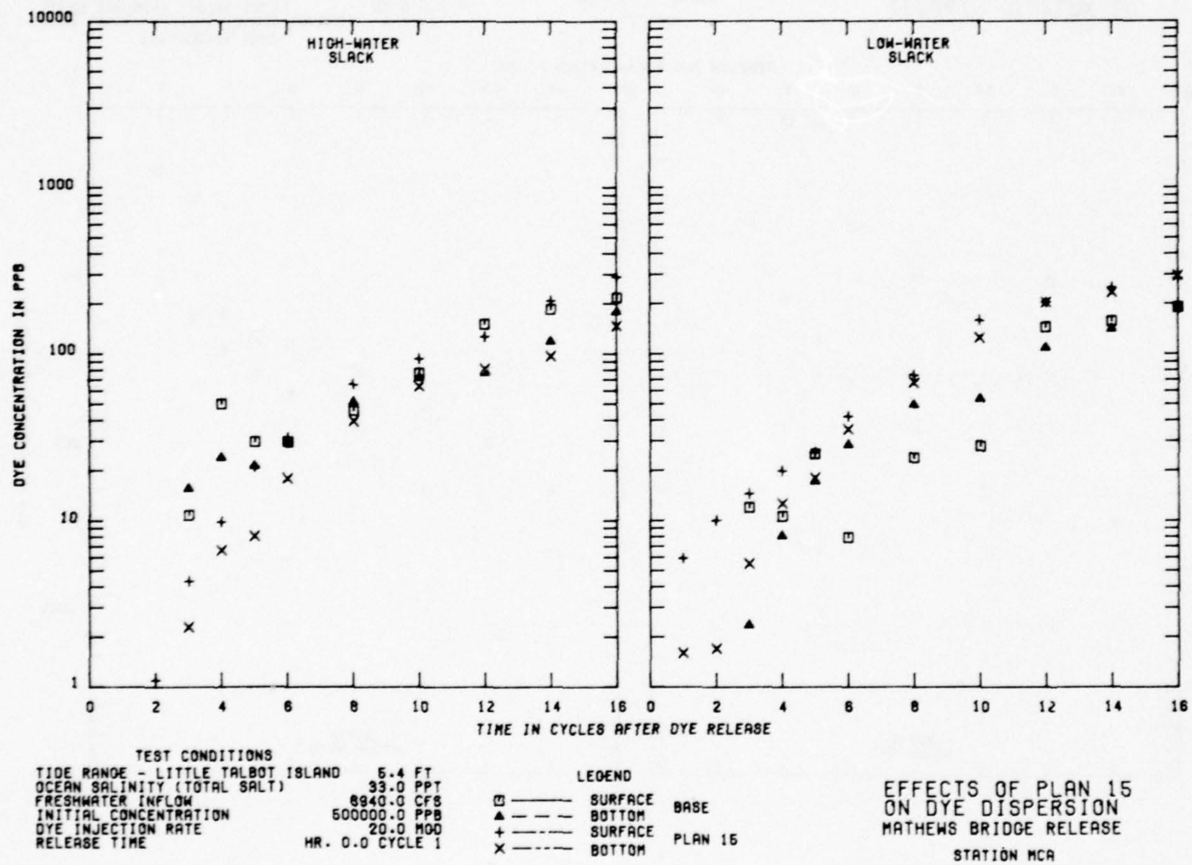
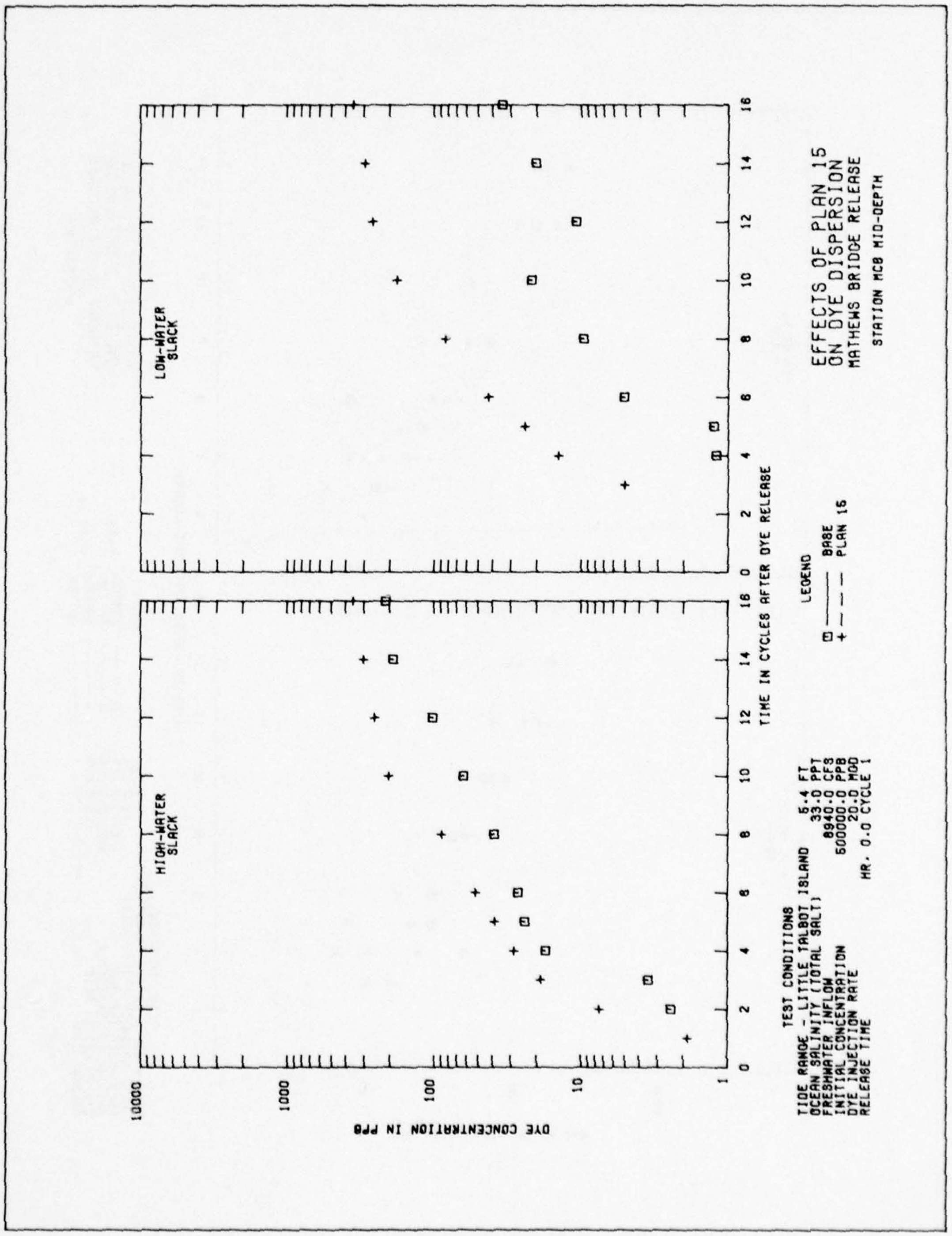
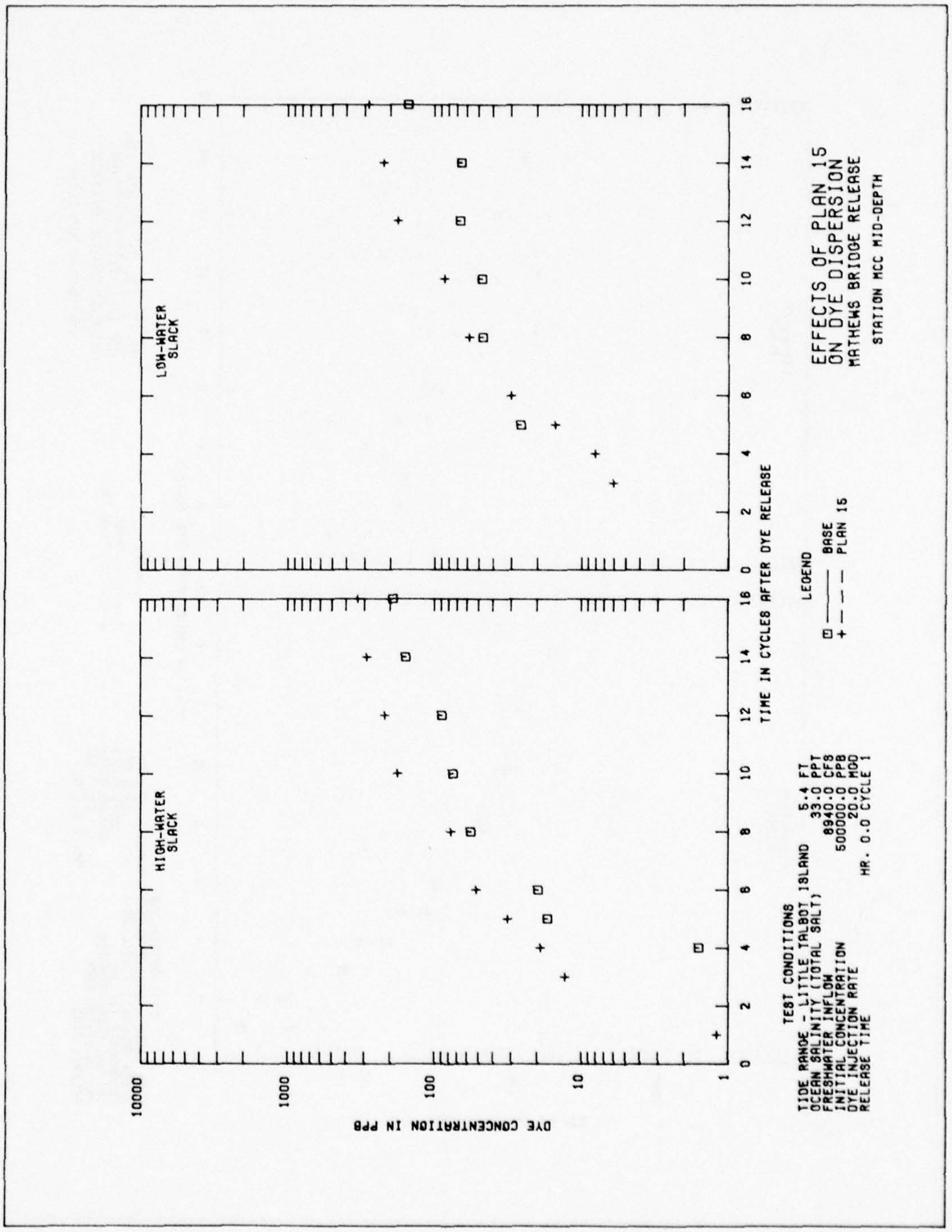

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 6940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 15
EFFECTS OF PLAN 15
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION MCA

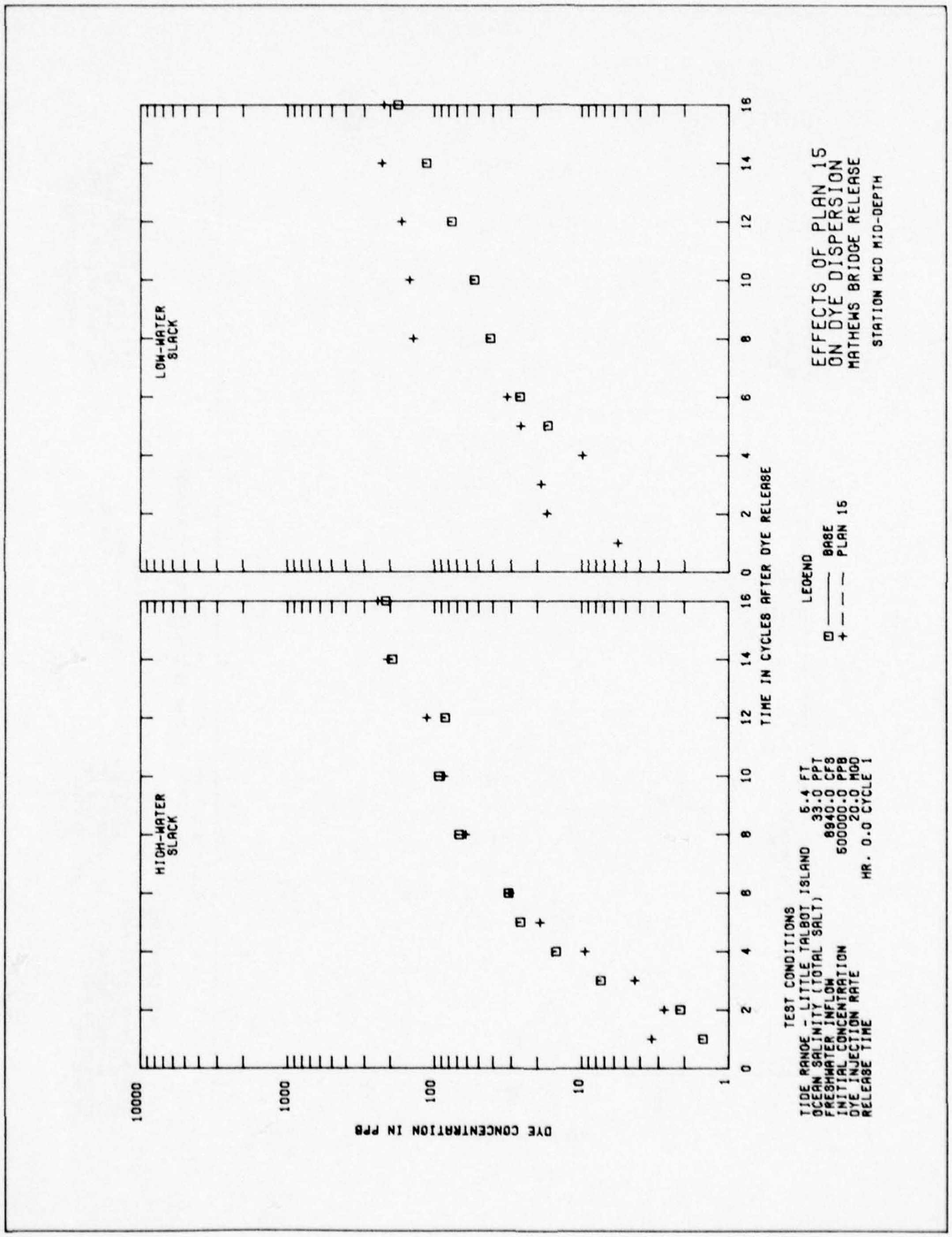
PLATE 177

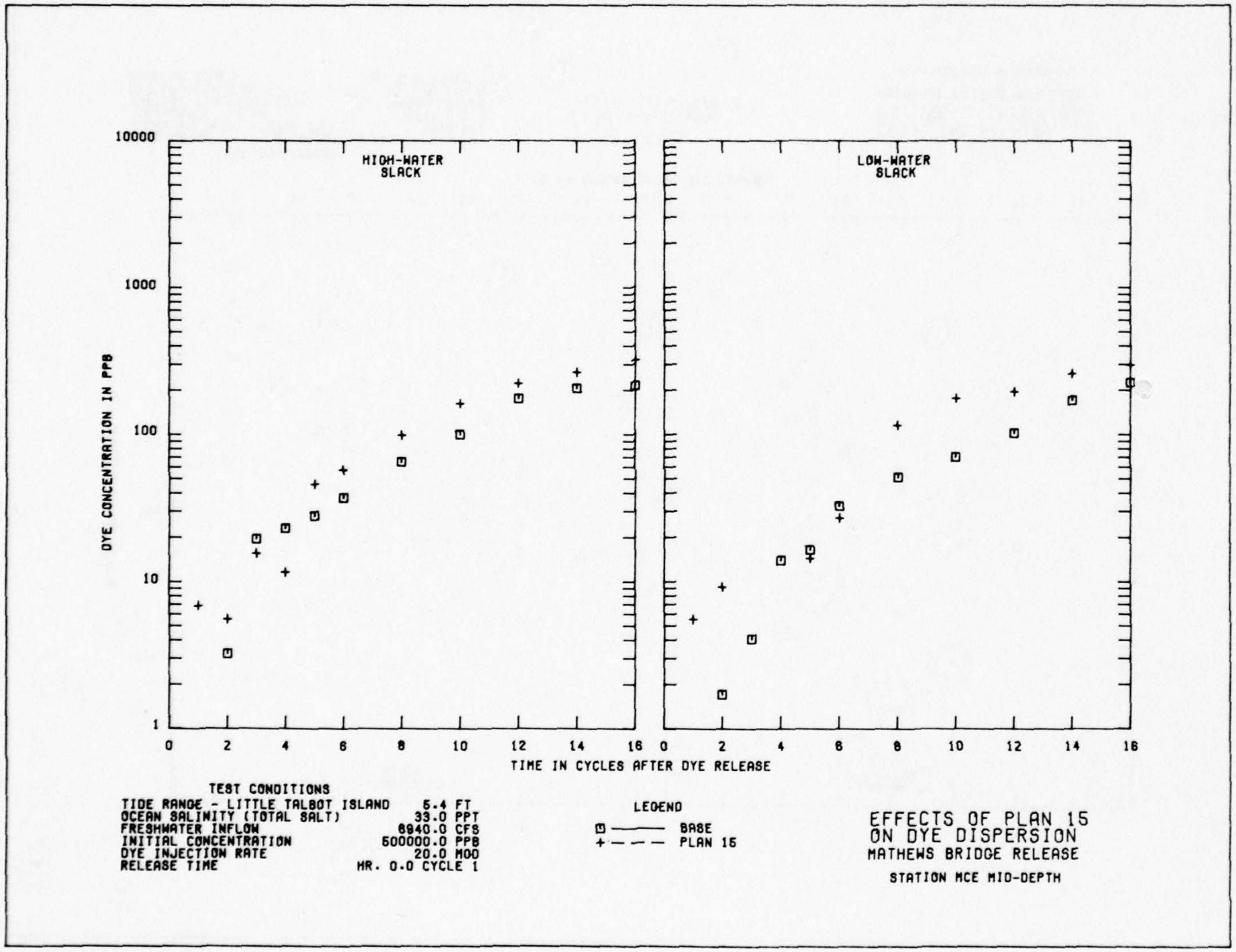


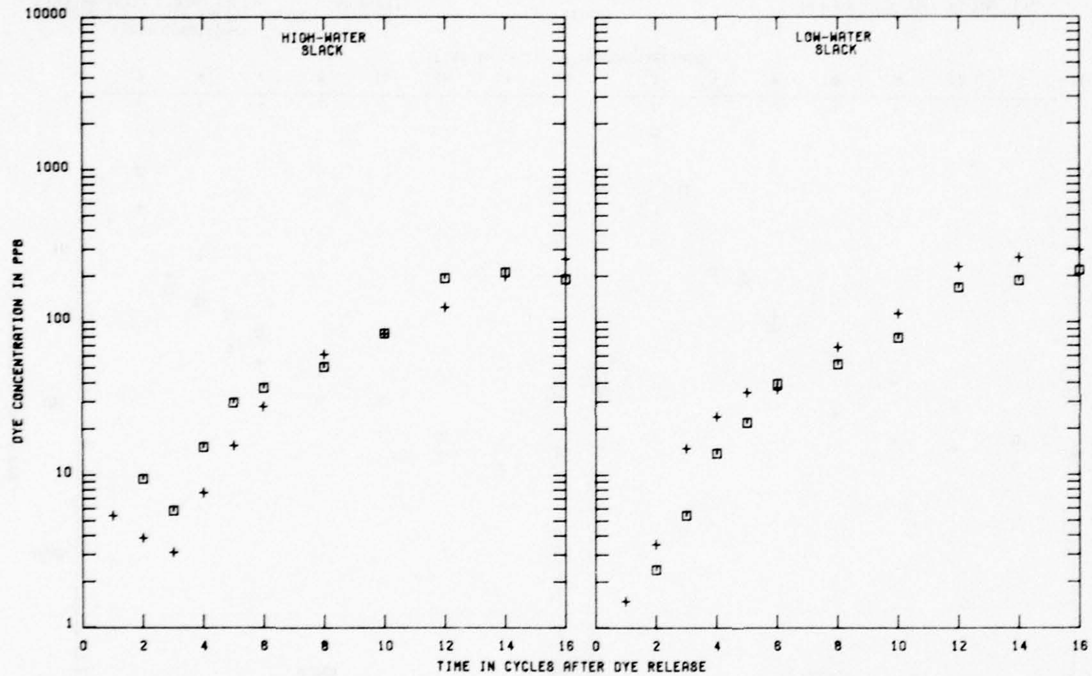
EFFECTS OF PLAN 15
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION MCB MID-DEPTH
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
LEGEND
BASE
PLAN 15
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MOD
RELEASE TIME HR. 0.0 CYCLE 1

PLATE 178


EFFECTS OF PLAN 15
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION MCC MID-DEPTH
HIGH-WATER
SLACK
LOW-WATER
SLACK
DYE CONCENTRATION IN PPB
TIME IN CYCLES AFTER DYE RELEASE
LEGEND
BASE
PLAN 15
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MOD
RELEASE TIME HR. 0.0 CYCLE 1


EFFECTS OF PLAN 15
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION MCD MID-DEPTH
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
TIME IN CYCLES AFTER DYE RELEASE
LEGEND
BASE
PLAN 15
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1


HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0 2 4 6 8 10 12 14 16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 6940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
BASE
PLAN 15
EFFECTS OF PLAN 15
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION MCE MID-DEPTH



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	20.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

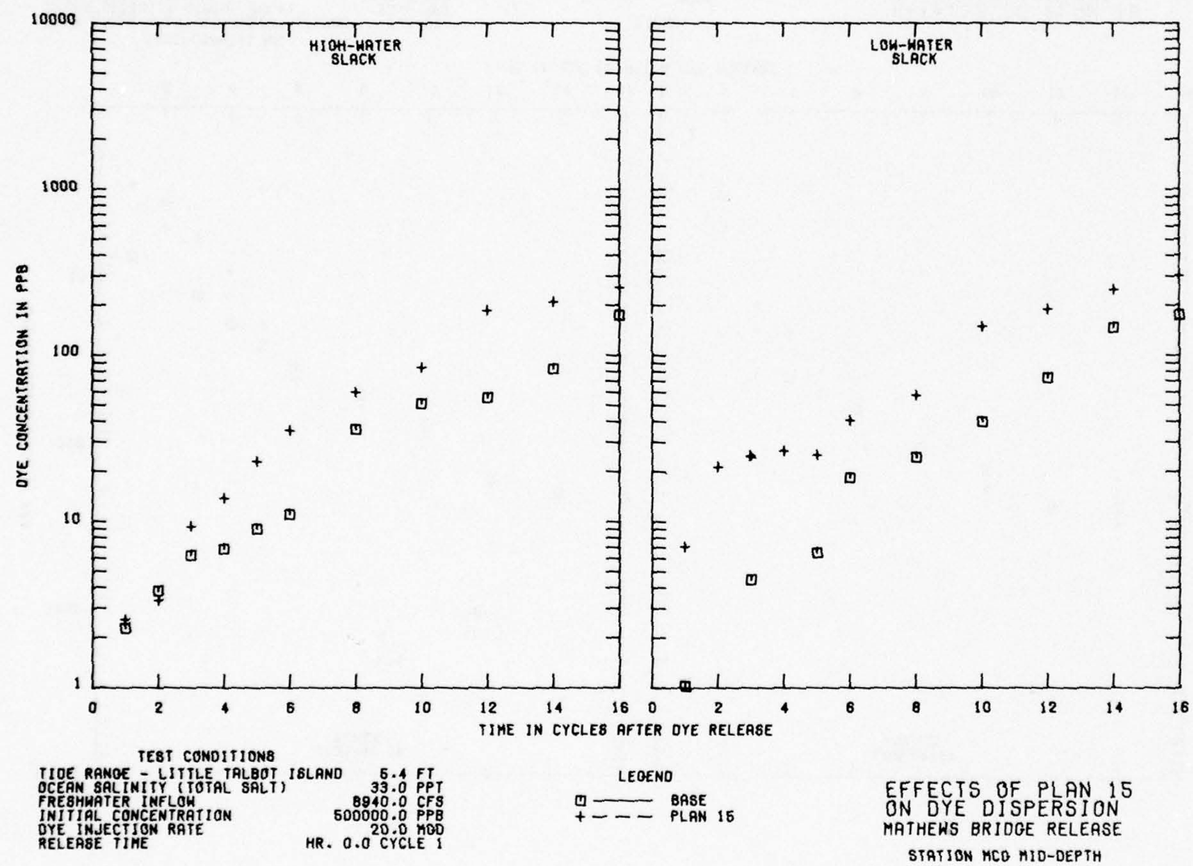
LEGEND

□ ——— BASE
+ — — — PLAN 15

EFFECTS OF PLAN 15
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE

STATION MCF MID-DEPTH

PLATE 182


HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0 2 4 6 8 10 12 14 16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
BASE
PLAN 15
EFFECTS OF PLAN 15
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION MCG MID-DEPTH

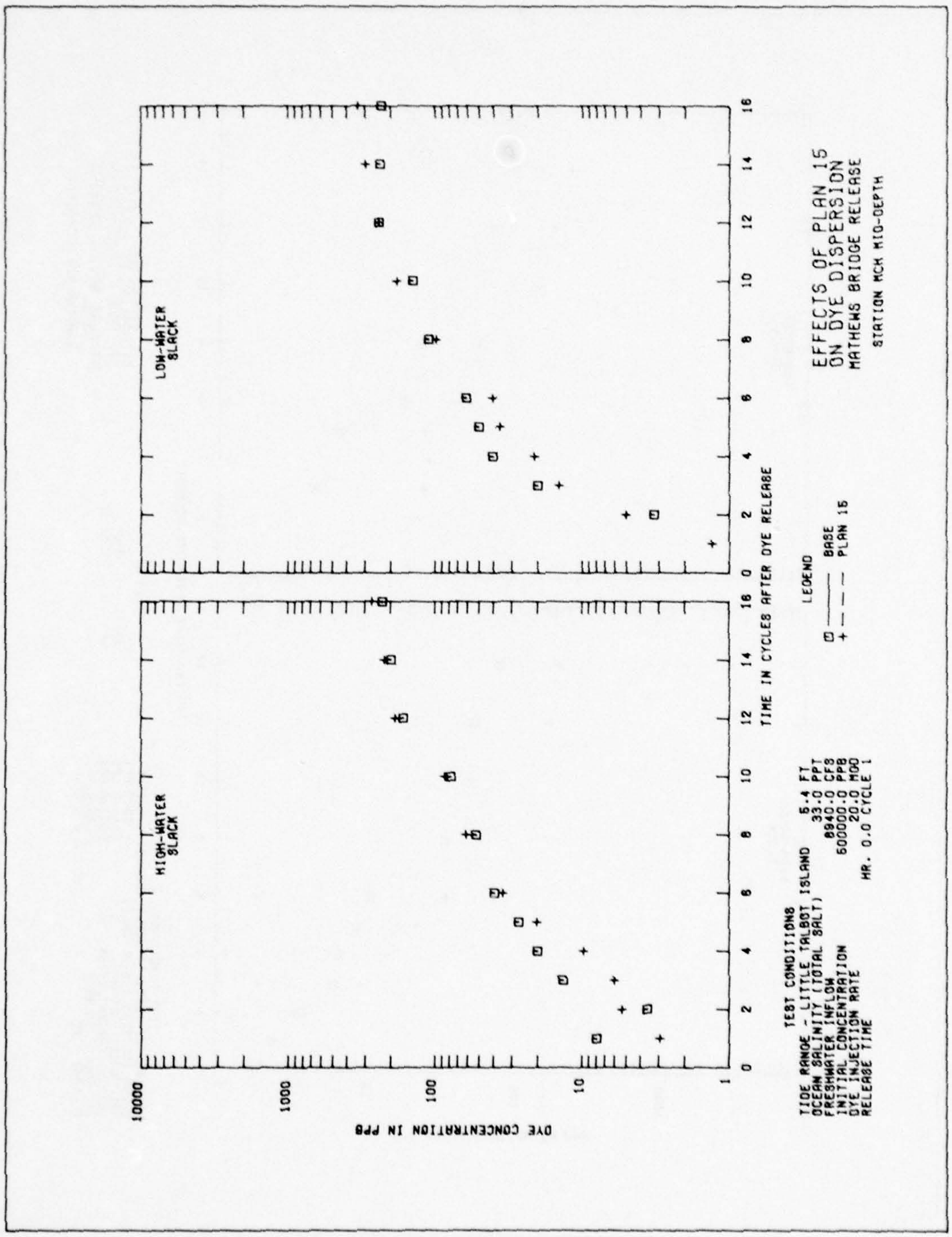

EFFECTS OF PLAN 15
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION MCM MID-DEPTH
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
TIME IN CYCLES AFTER DYE RELEASE
LEGEND
BASE
PLAN 15
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1

PLATE 184

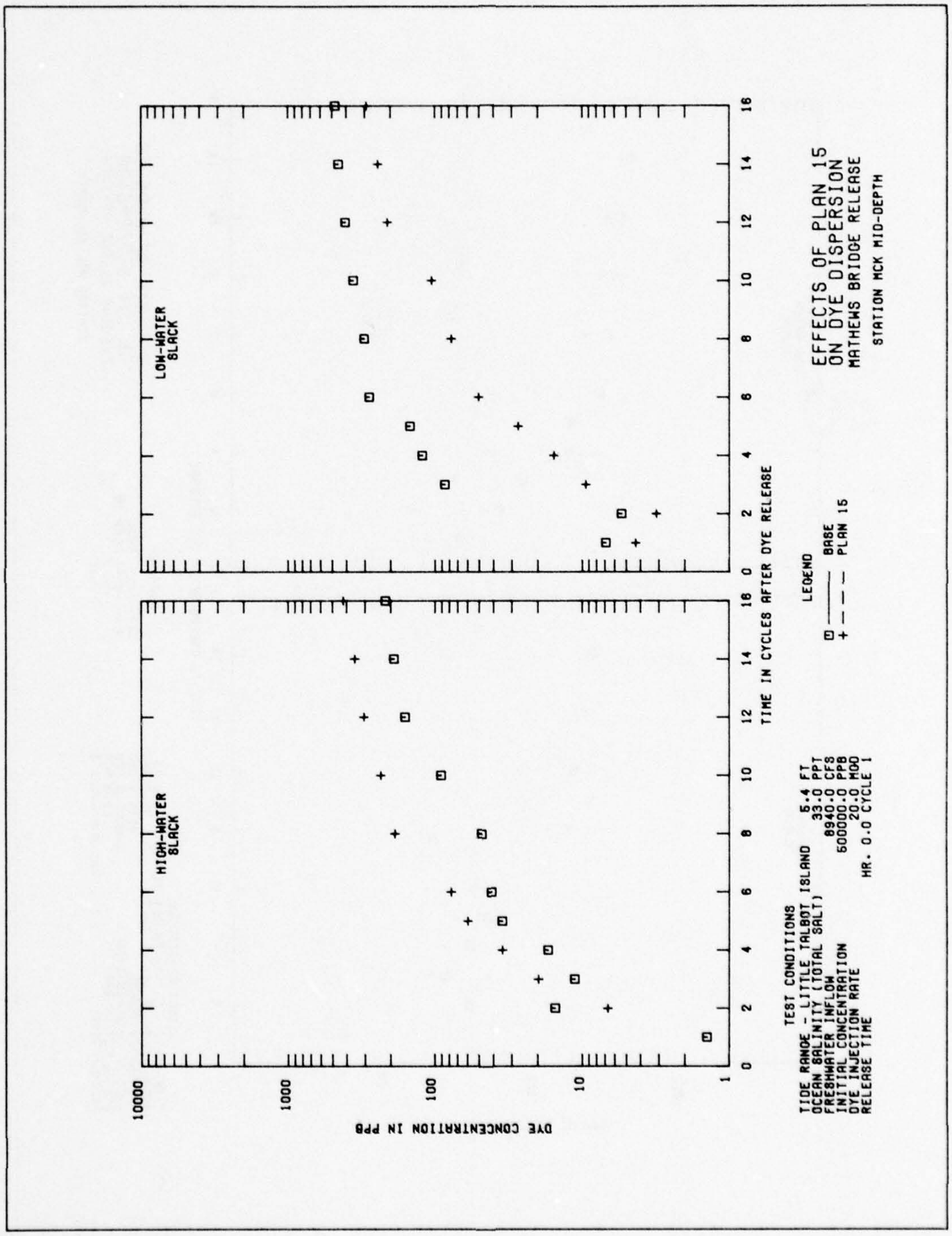
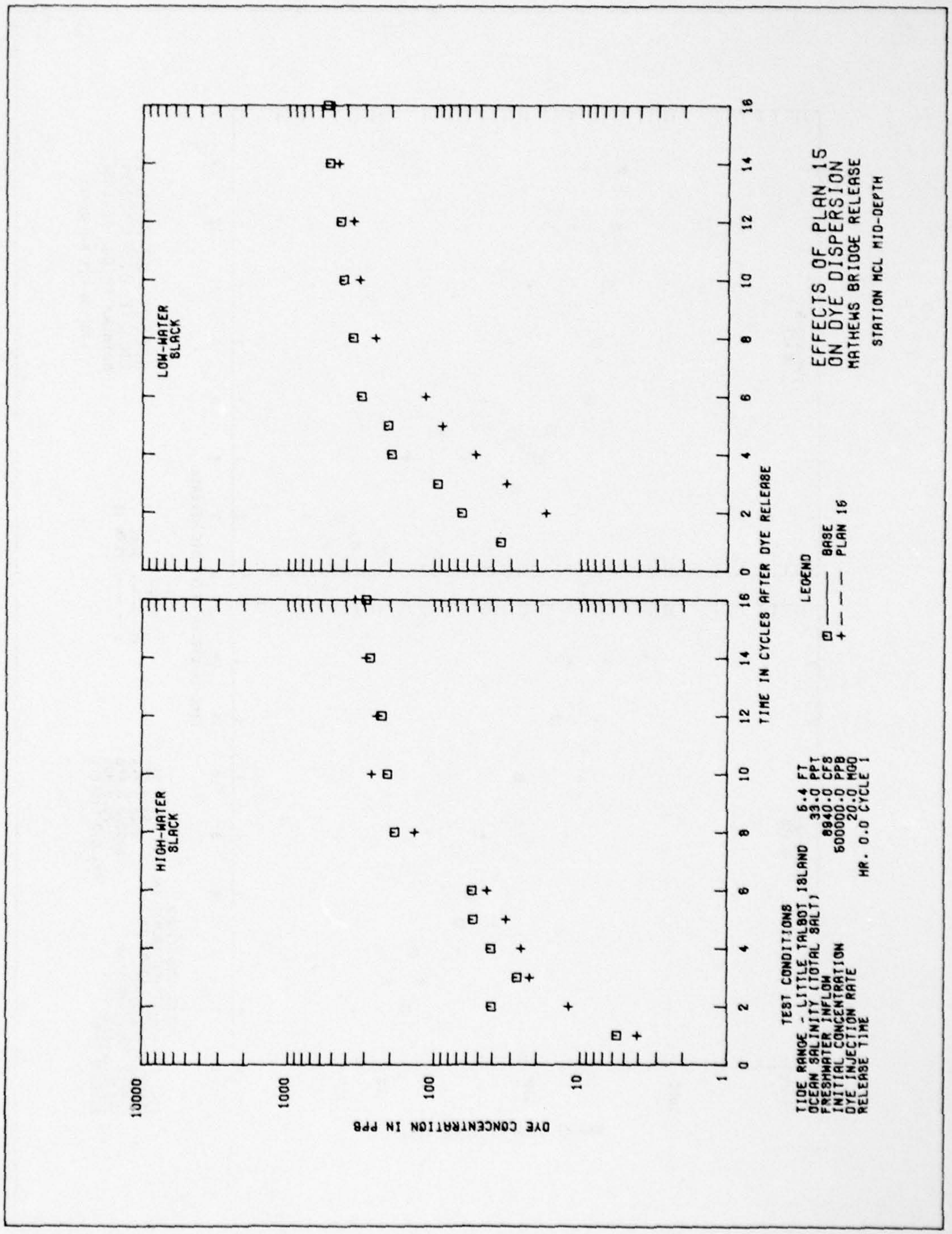
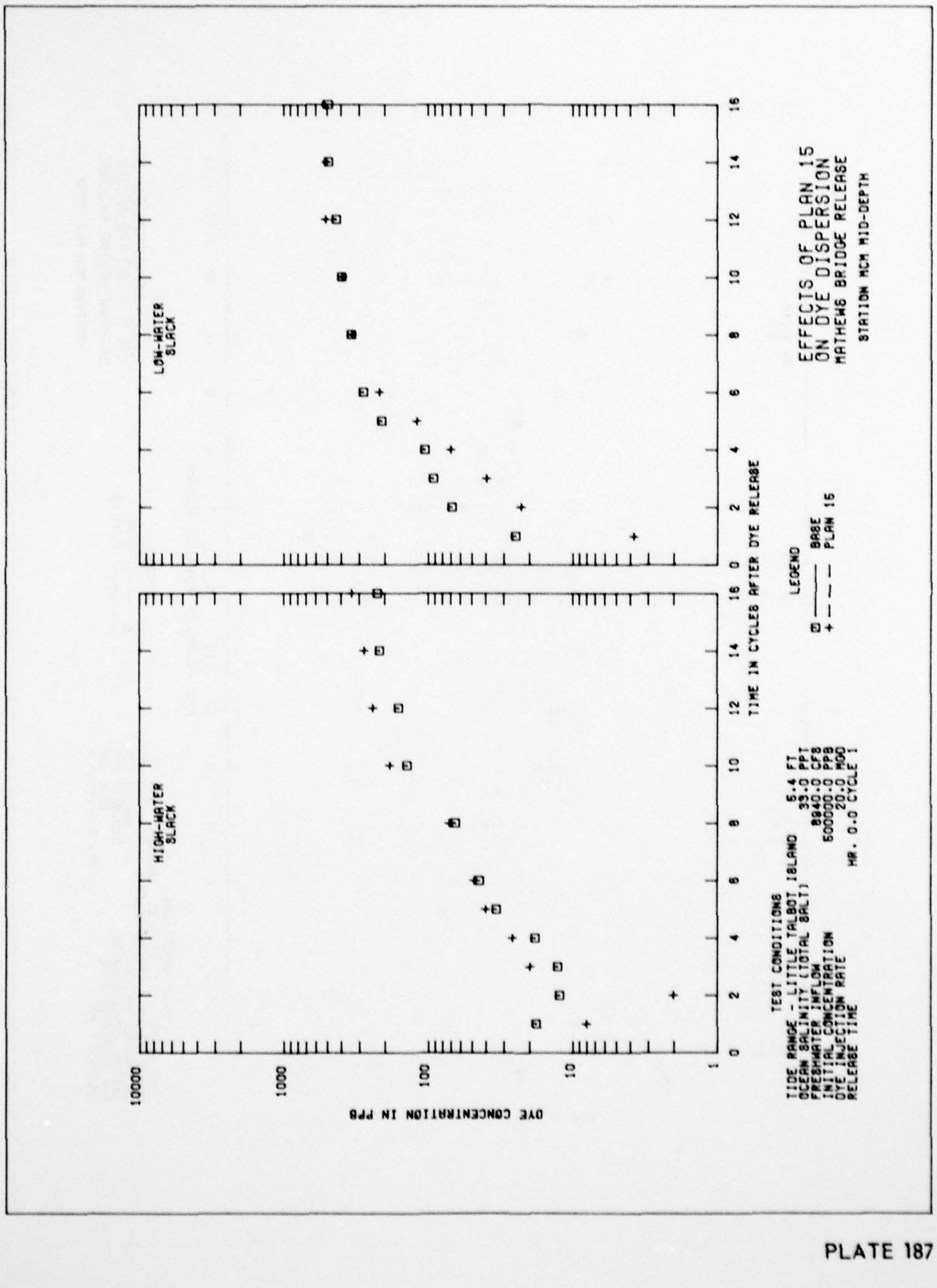

EFFECTS OF PLAN 15
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION MCK MID-DEPTH
HIGH-WATER
SLACK
LOW-WATER
SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
TIME IN CYCLES AFTER DYE RELEASE
0
2
4
6
8
10
12
14
16
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
BASE
PLAN 15

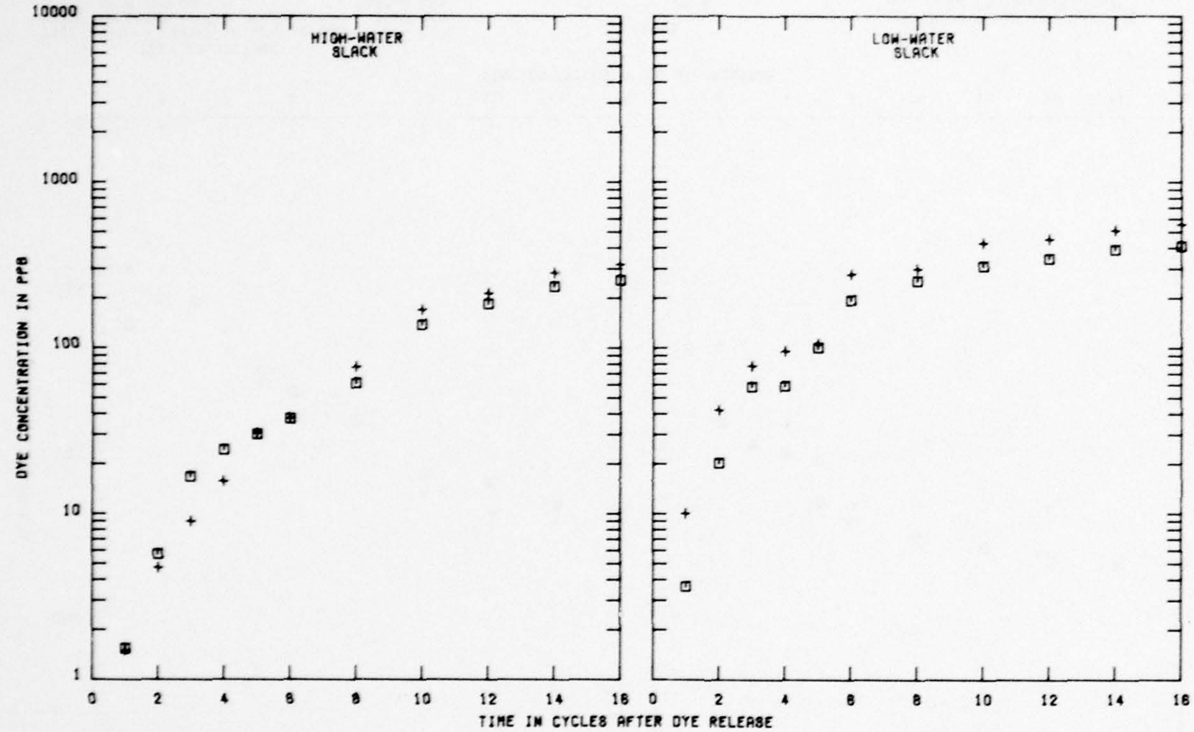
PLATE 185



EFFECTS OF PLAN 15
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION MCL MID-DEPTH
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0 2 4 6 8 10 12 14 16
TIME IN CYCLES AFTER DYE RELEASE
LEGEND
BASE
PLAN 15
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 6.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1

PLATE 186


EFFECTS OF PLAN 15
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION MCM MID-DEPTH
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
LEGEND
BASE
PLAN 15
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1



TEST CONDITIONS

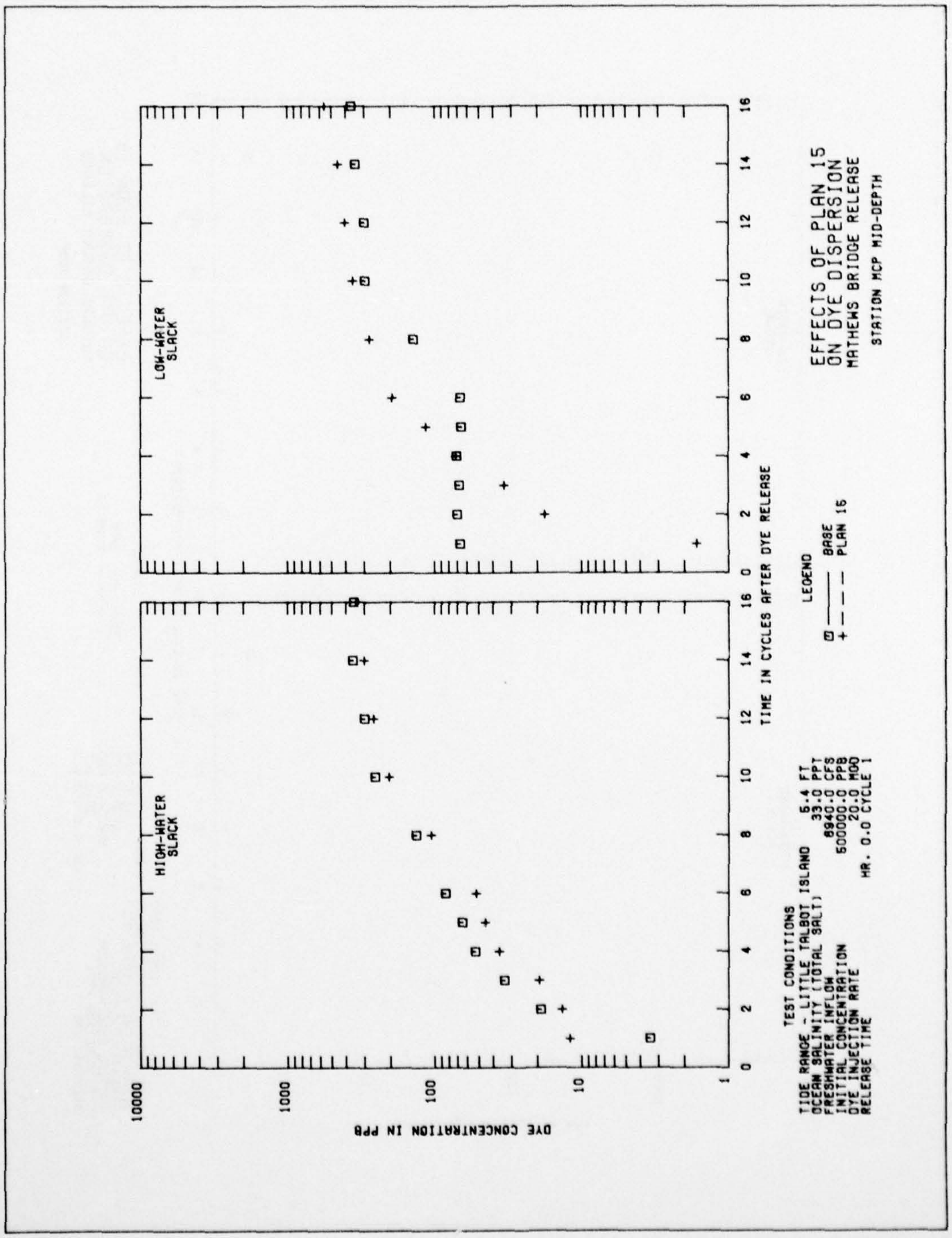
TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	20.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

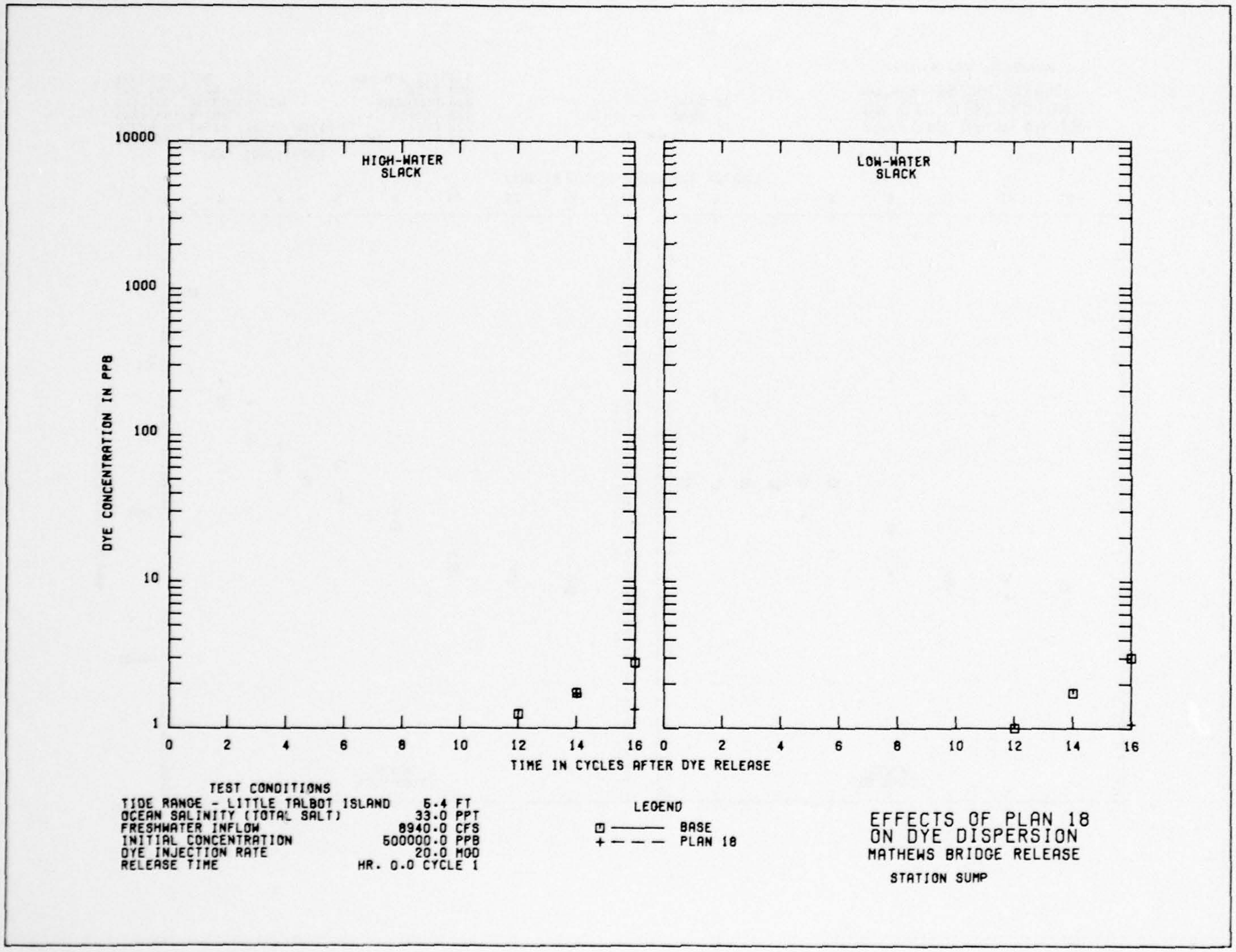
⊡ ——— BASE
+ — — — PLAN 15

EFFECTS OF PLAN 15
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE

STATION MCN MID-DEPTH



EFFECTS OF PLAN 15
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION MCP MID-DEPTH
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
TIME IN CYCLES AFTER DYE RELEASE
0
2
4
6
8
10
12
14
16
LEGEND
BASE
PLAN 15
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MOD
RELEASE TIME HR. 0.0 CYCLE 1



HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0 2 4 6 8 10 12 14 16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MOD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
BASE
PLAN 18
EFFECTS OF PLAN 18
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION SUMP

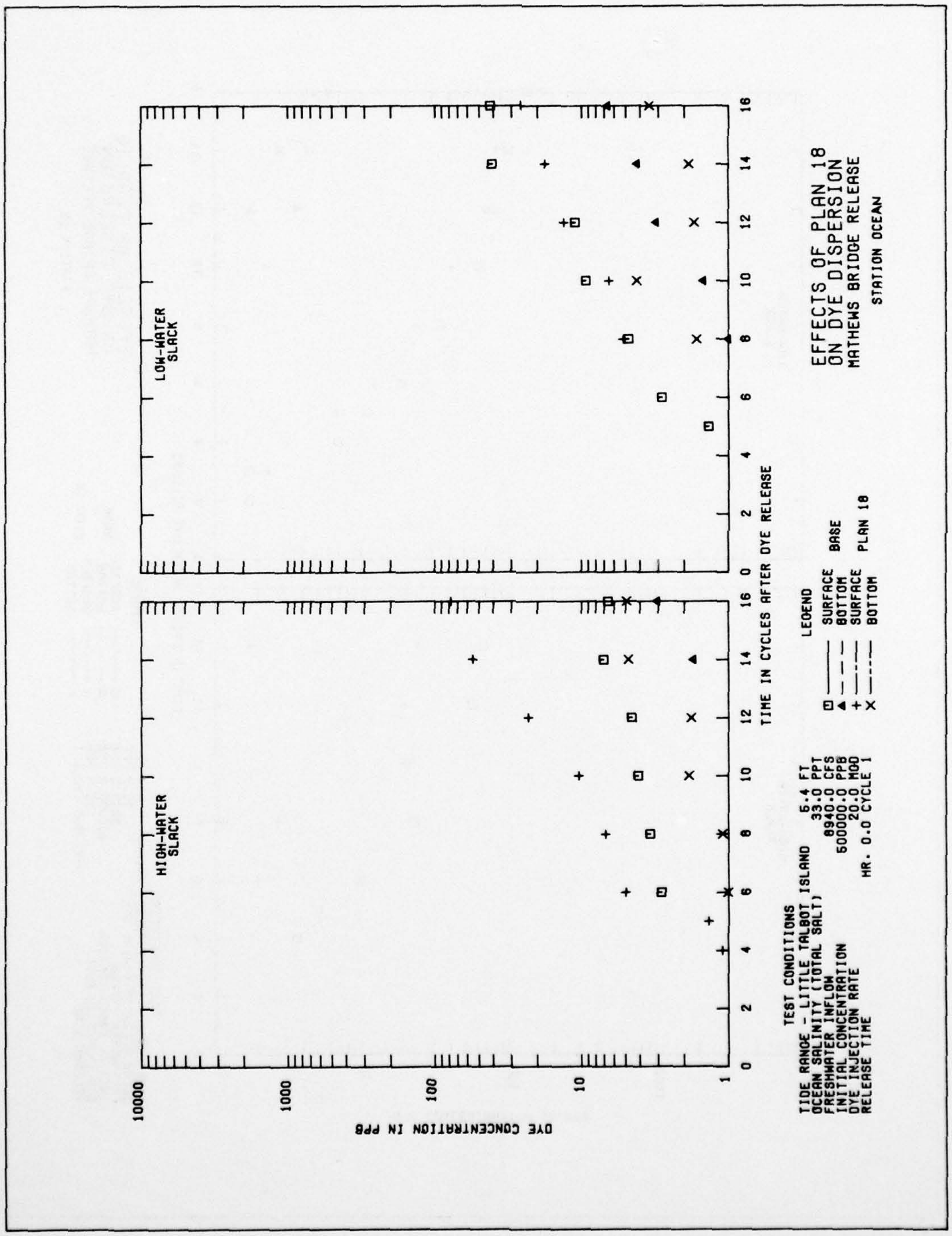
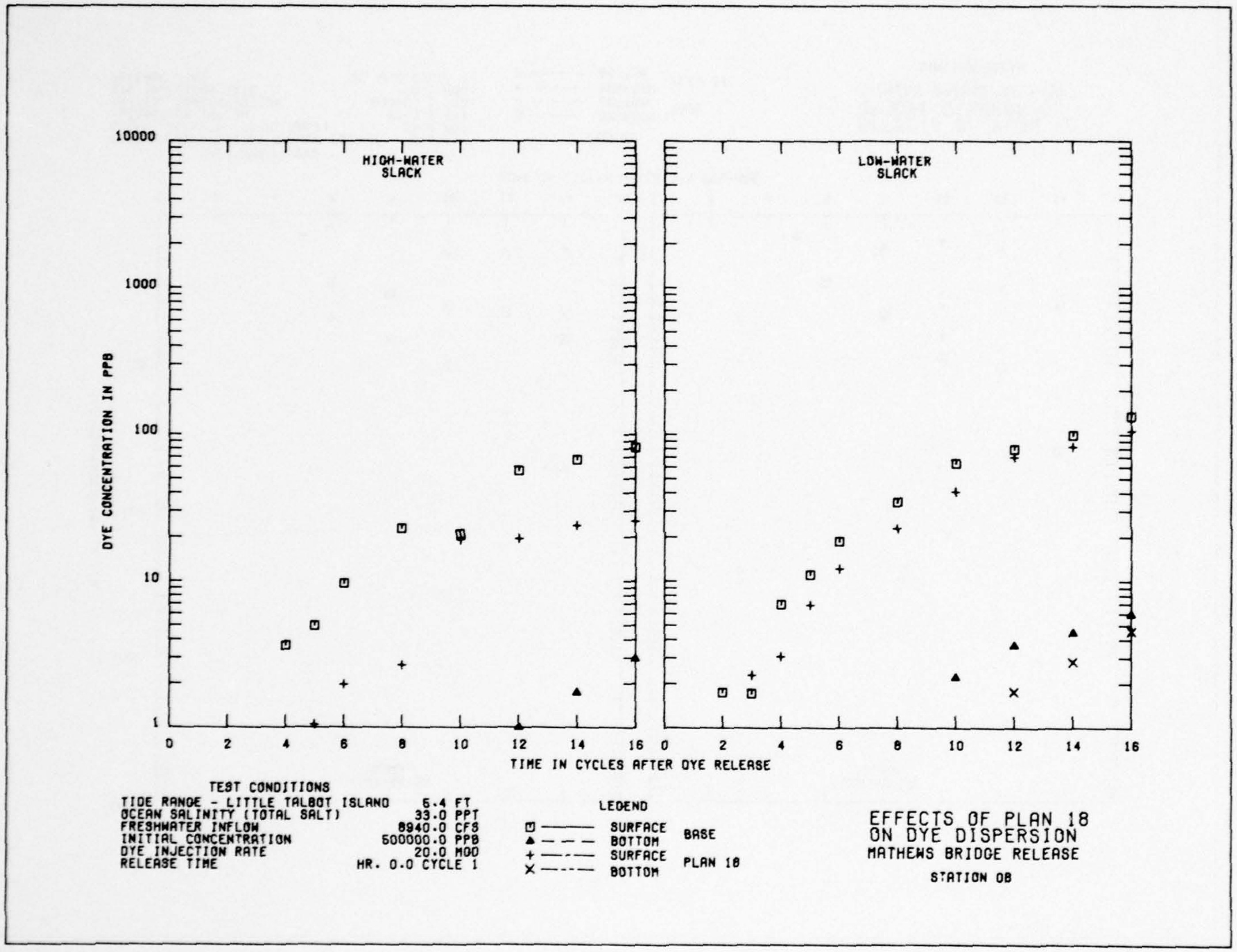
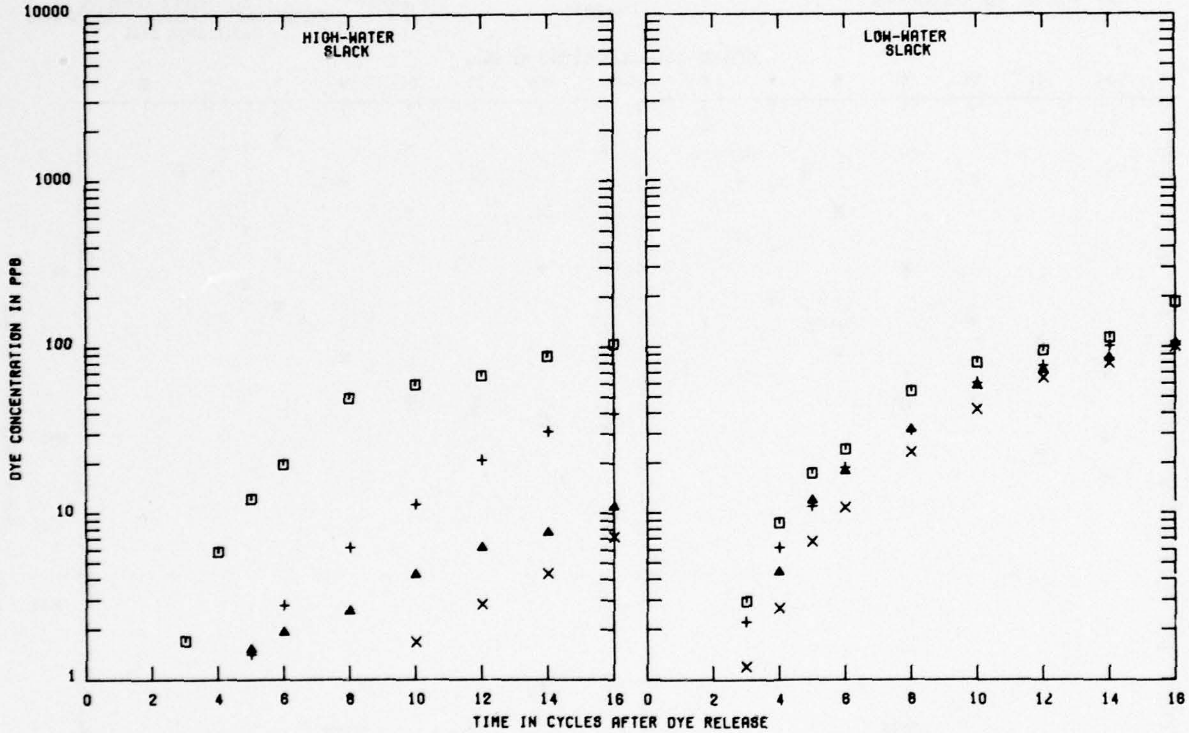

EFFECTS OF PLAN 18
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION OCEAN
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
TIME IN CYCLES AFTER DYE RELEASE
0
2
4
6
8
10
12
14
16
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 18

PLATE 191



EFFECTS OF PLAN 18
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION 08



TEST CONDITIONS

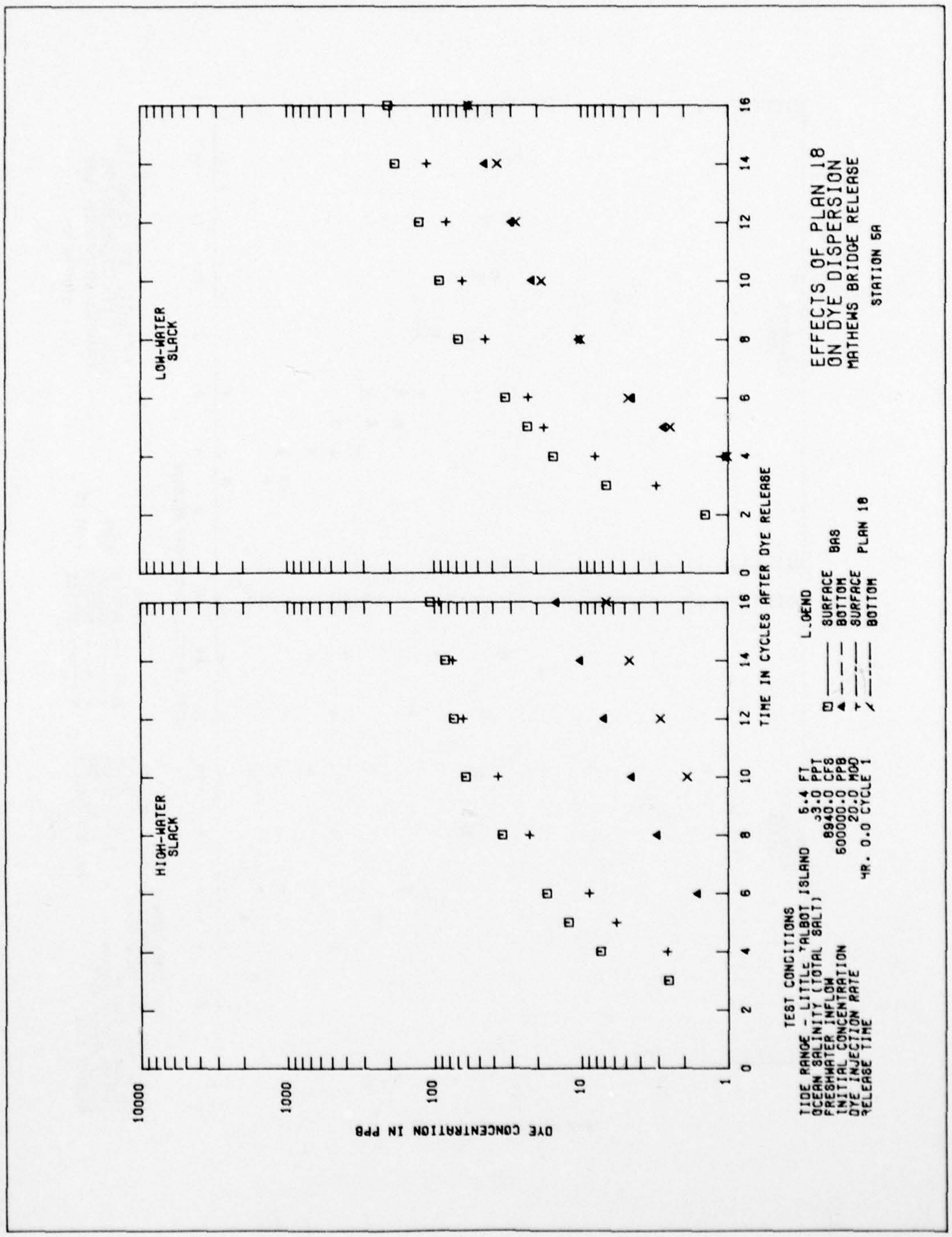
TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	20.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

□	SURFACE	BASE
▲	BOTTOM	
+	SURFACE	PLAN 18
×	BOTTOM	

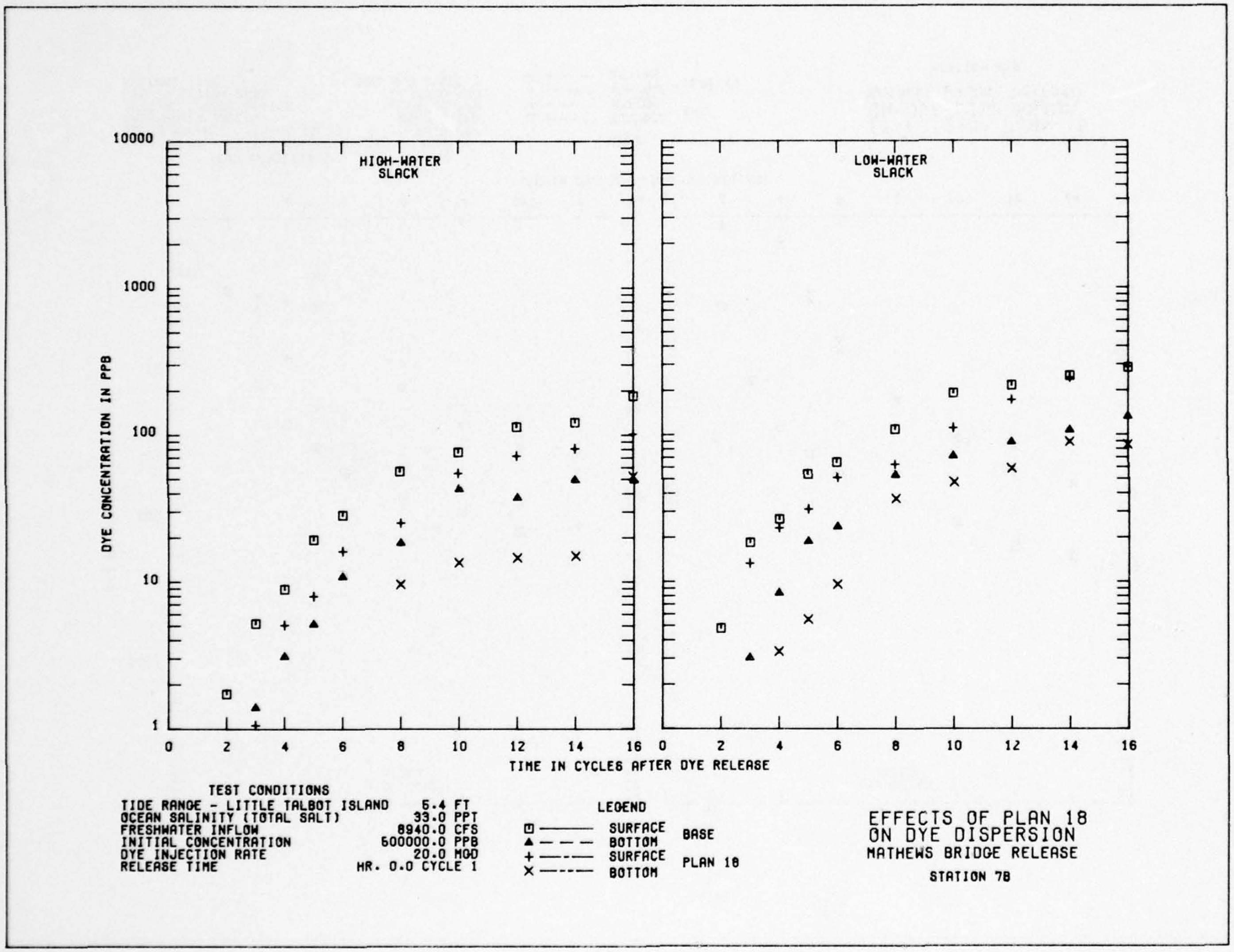
EFFECTS OF PLAN 18
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE

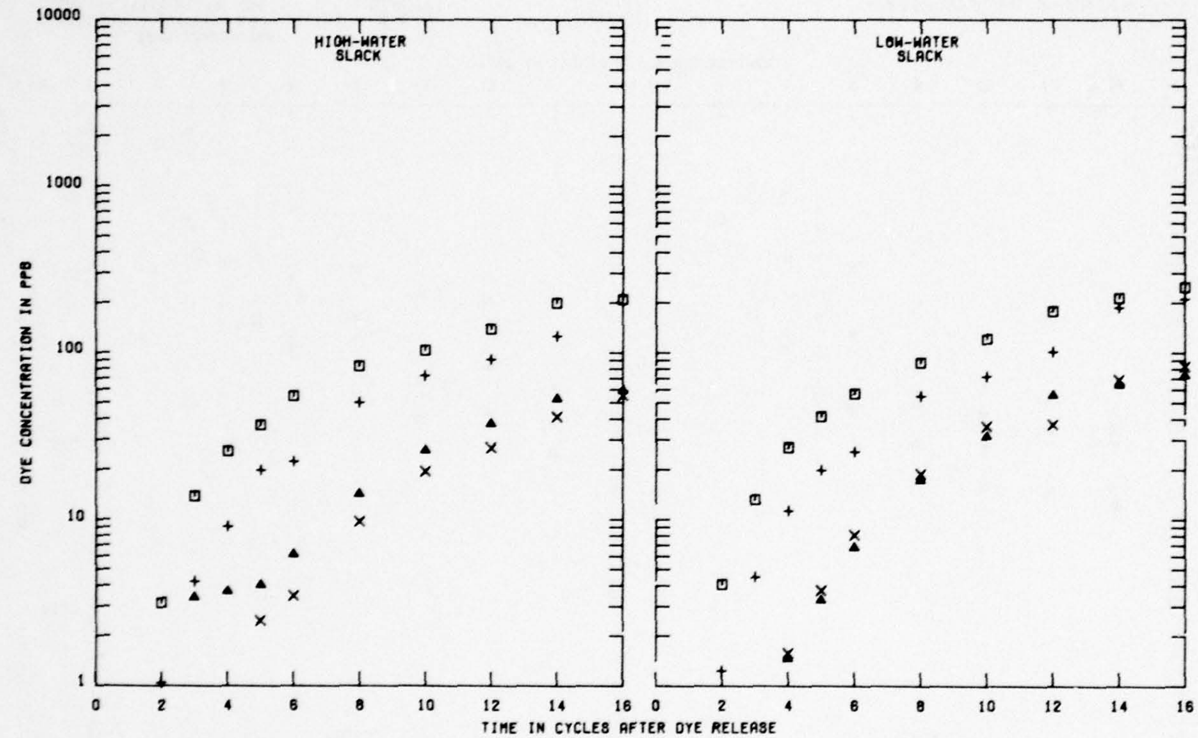
STATION 3A



DYE CONCENTRATION IN PPB
10000
1000
100
10
1
HIGH-WATER SLACK
LOW-WATER SLACK
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 20.0 MOD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE BAS
BOTTOM
SURFACE PLAN 18
BOTTOM
EFFECTS OF PLAN 18
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION 5A

PLATE 194


HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0 2 4 6 8 10 12 14 16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 18
EFFECTS OF PLAN 18
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION 78



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	600000.0 PPB
DYE INJECTION RATE	20.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

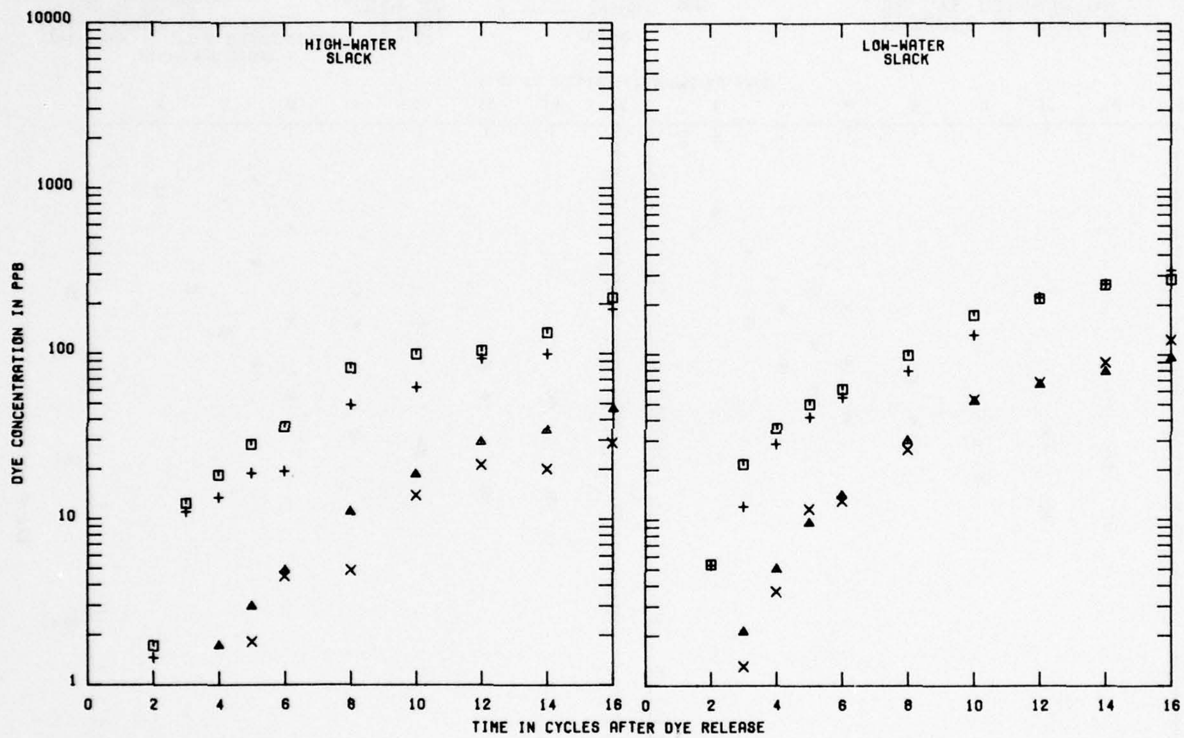
LEGEND

⊡ ——— SURFACE BASE
▲ — — — BOTTOM
\+ —·—·— SURFACE PLAN 18
× —··—·· BOTTOM

EFFECTS OF PLAN 18
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE

STATION 9AB

PLATE 196



TEST CONDITIONS

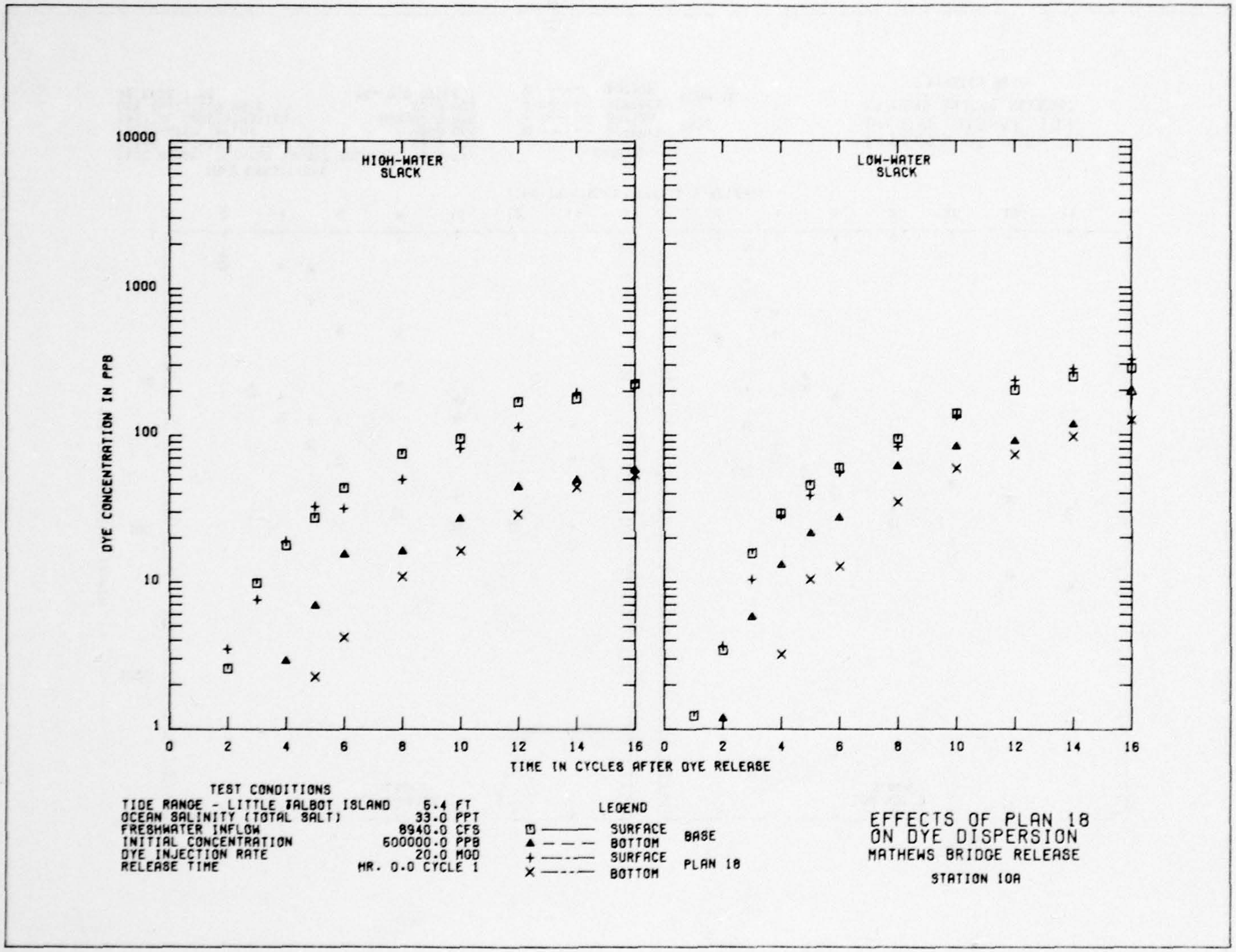
TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	20.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

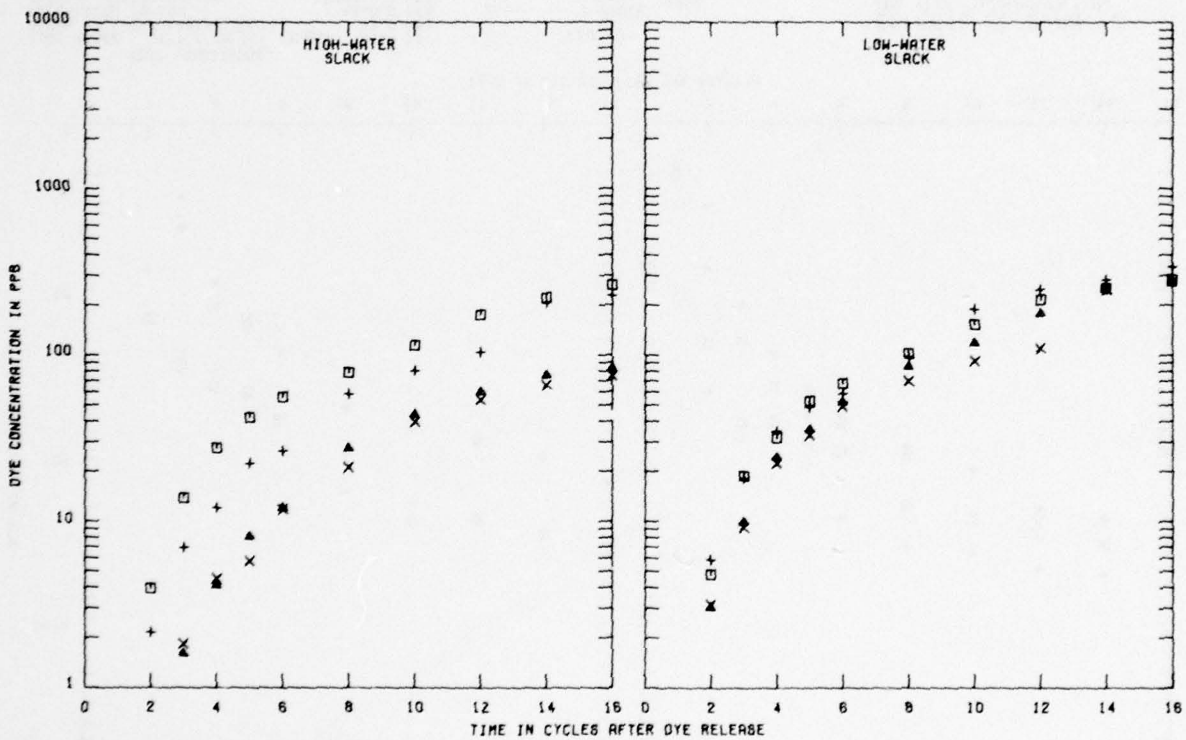
⊡ ———	SURFACE	BASE
▲ — — —	BOTTOM	
+ —·—·—	SURFACE	PLAN 18
× —··—··—	BOTTOM	

EFFECTS OF PLAN 18
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE

STATION 9B



HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 18
EFFECTS OF PLAN 18
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION 10A



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	20.0 MOD
RELEASE TIME	HR. 0.0 CYCLE I

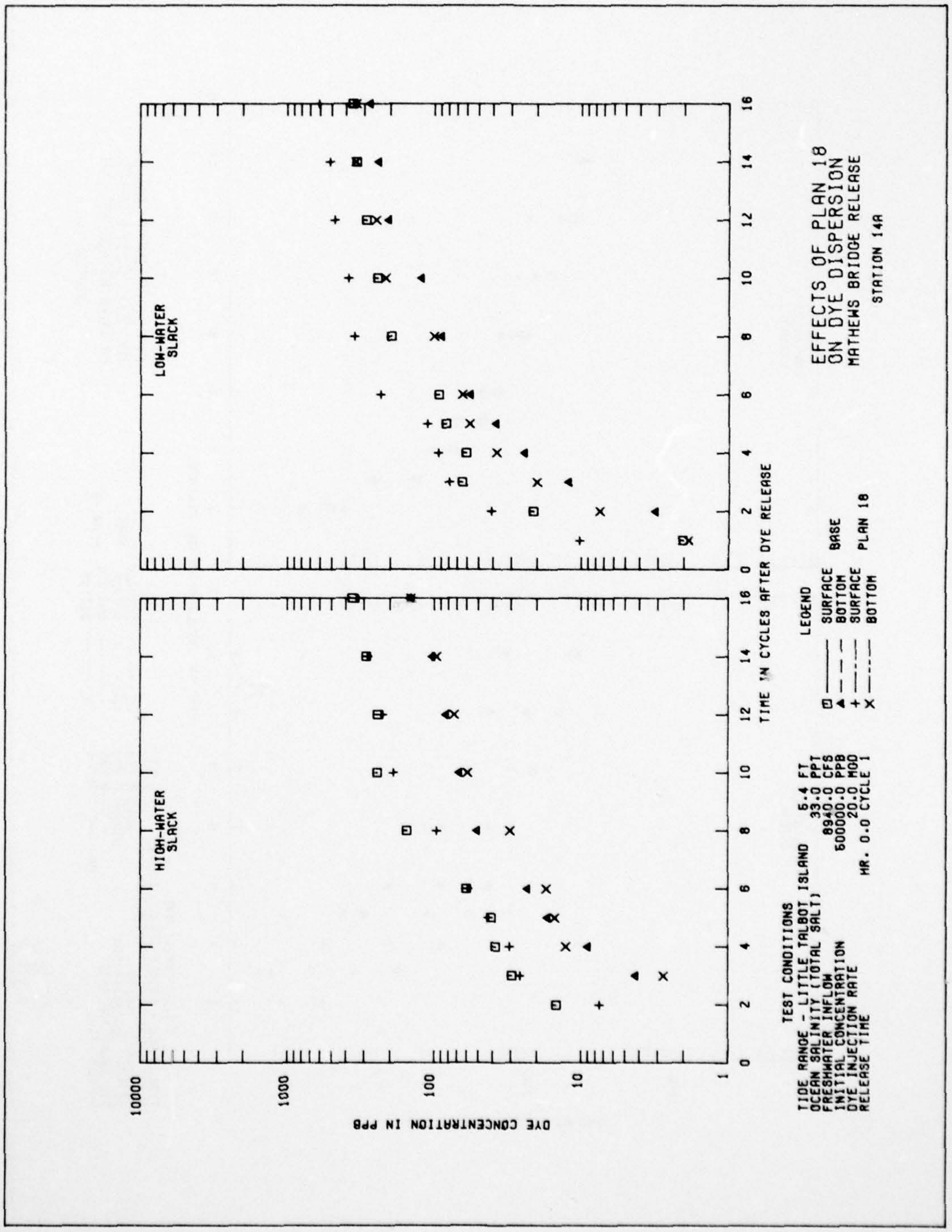
LEGEND

⊡ ———	SURFACE	BASE
▲ — — —	BOTTOM	
+ —·—·—	SURFACE	PLAN 18
X —··—··	BOTTOM	

EFFECTS OF PLAN 18
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE

STATION 11A

PLATE 199



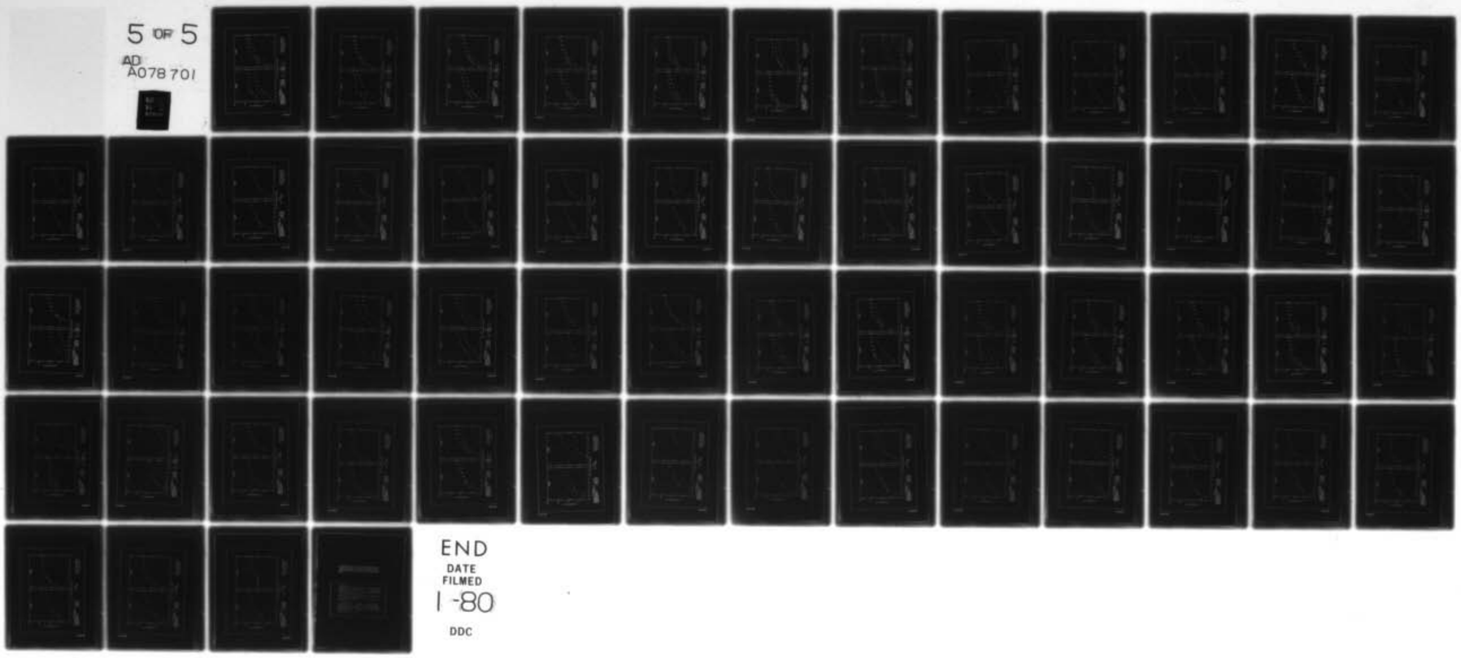
EFFECTS OF PLAN 18
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION 14A
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MOD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 18

PLATE 200

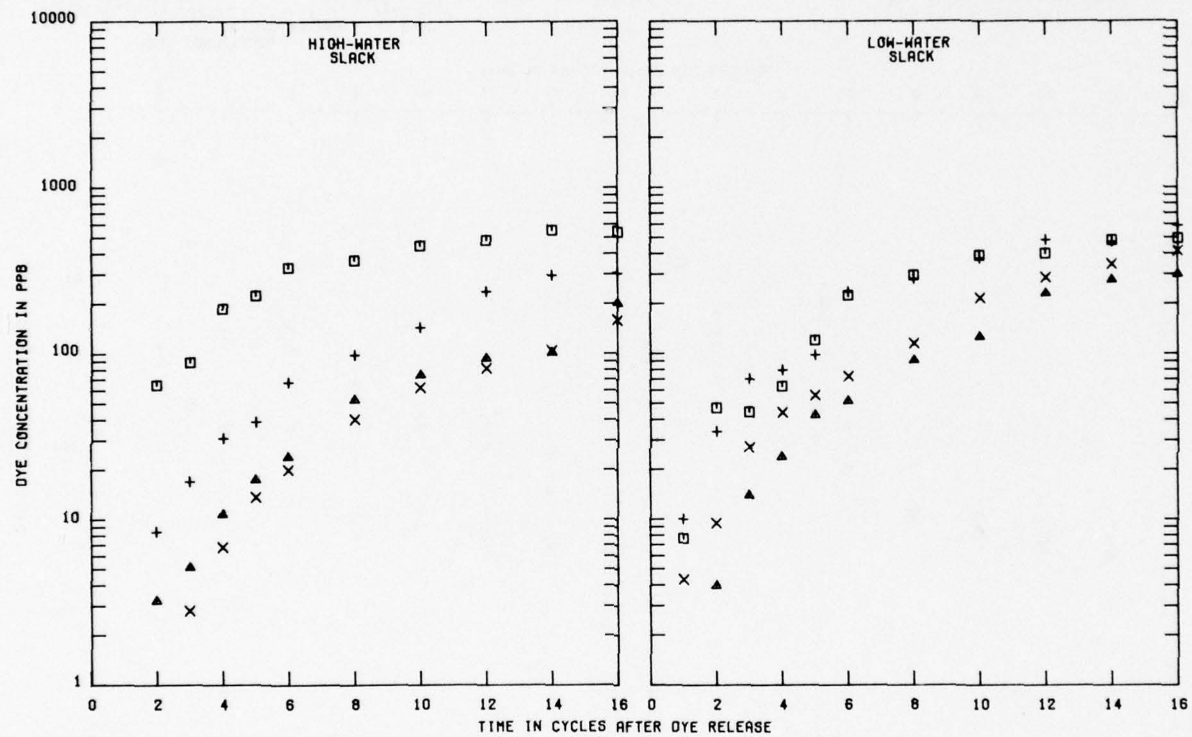
AD-A078 701 ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG--ETC F/G 8/8
MAYPORT-MILL COVE MODEL STUDY. REPORT 3. MILL COVE STUDY. HYDRA--ETC(U)
SEP 79 N J BROGDON, J W PARMAN

UNCLASSIFIED WES/HL-79-12-3 NL

5 OF 5
AD
A078701



END
DATE
FILMED
1-80
DDC



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	600000.0 PPB
DYE INJECTION RATE	20.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

□ ———	SURFACE	BASE
▲ — — —	BOTTOM	
+ —·—·—	SURFACE	PLAN 18
× —··—··—	BOTTOM	

EFFECTS OF PLAN 18
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE

STATION 15A

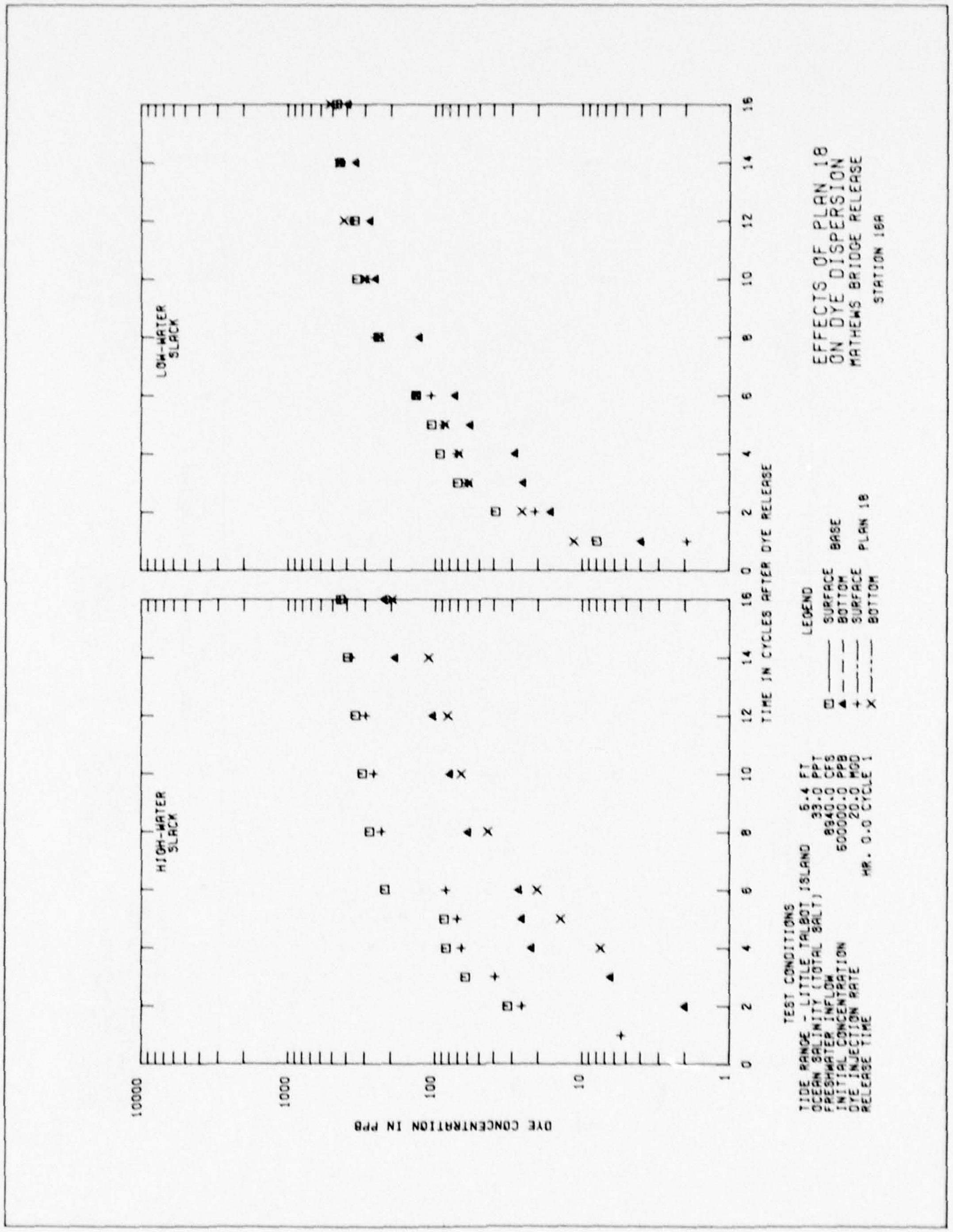

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE BASE
BOTTOM
SURFACE PLAN 18
BOTTOM
EFFECTS OF PLAN 18
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION 16A

PLATE 202

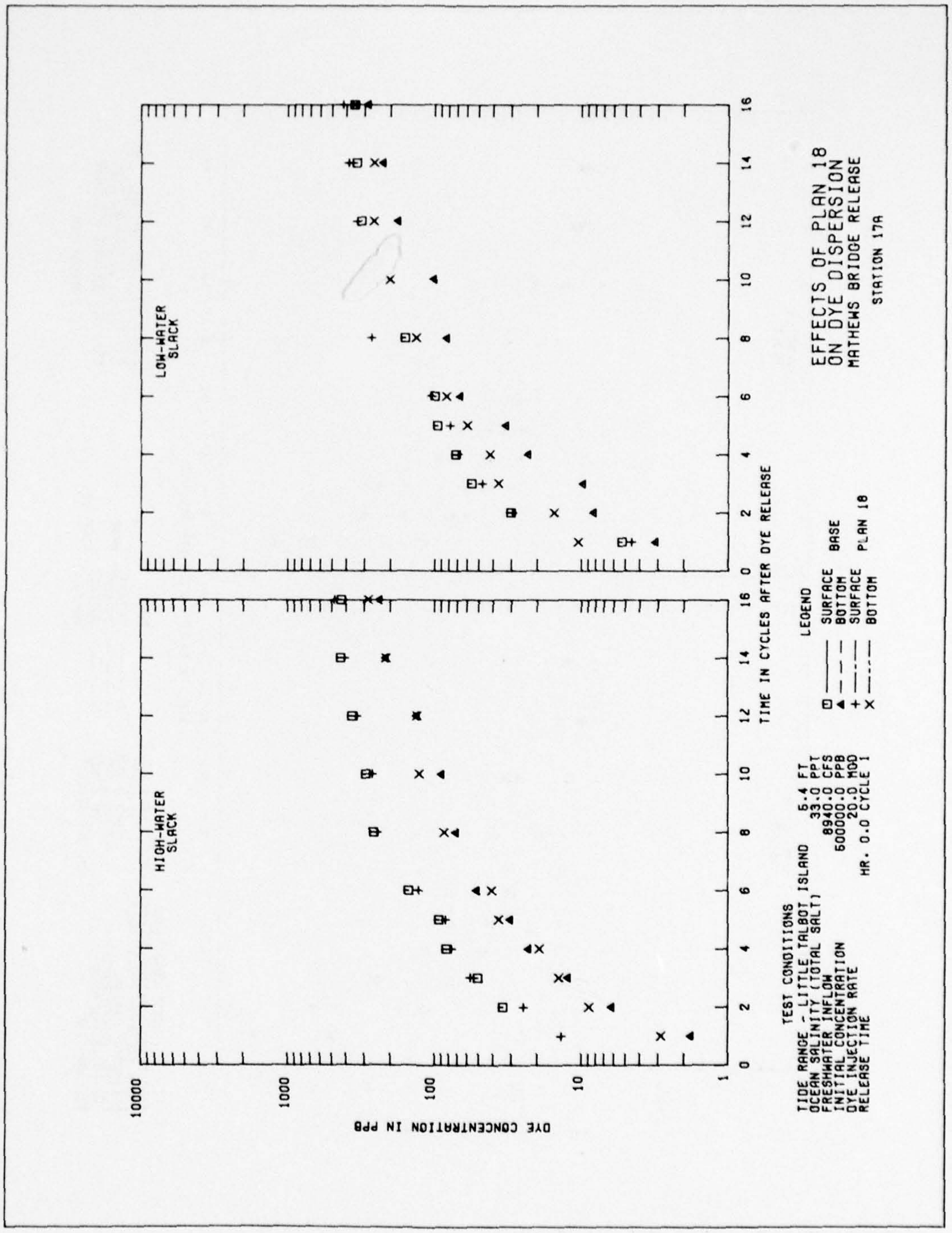

EFFECTS OF PLAN 18
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION 17A
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE BASE
BOTTOM
SURFACE PLAN 18
BOTTOM

PLATE 203

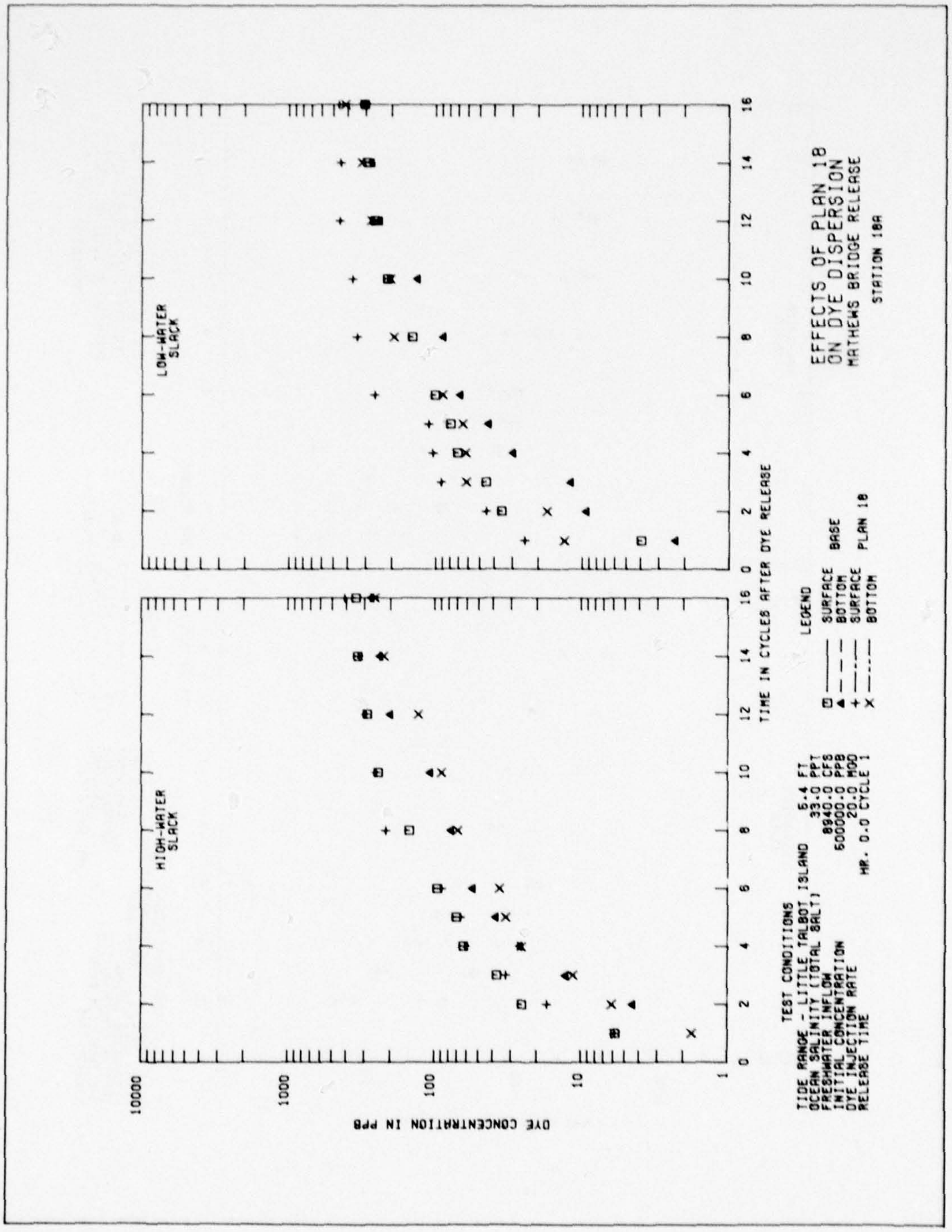
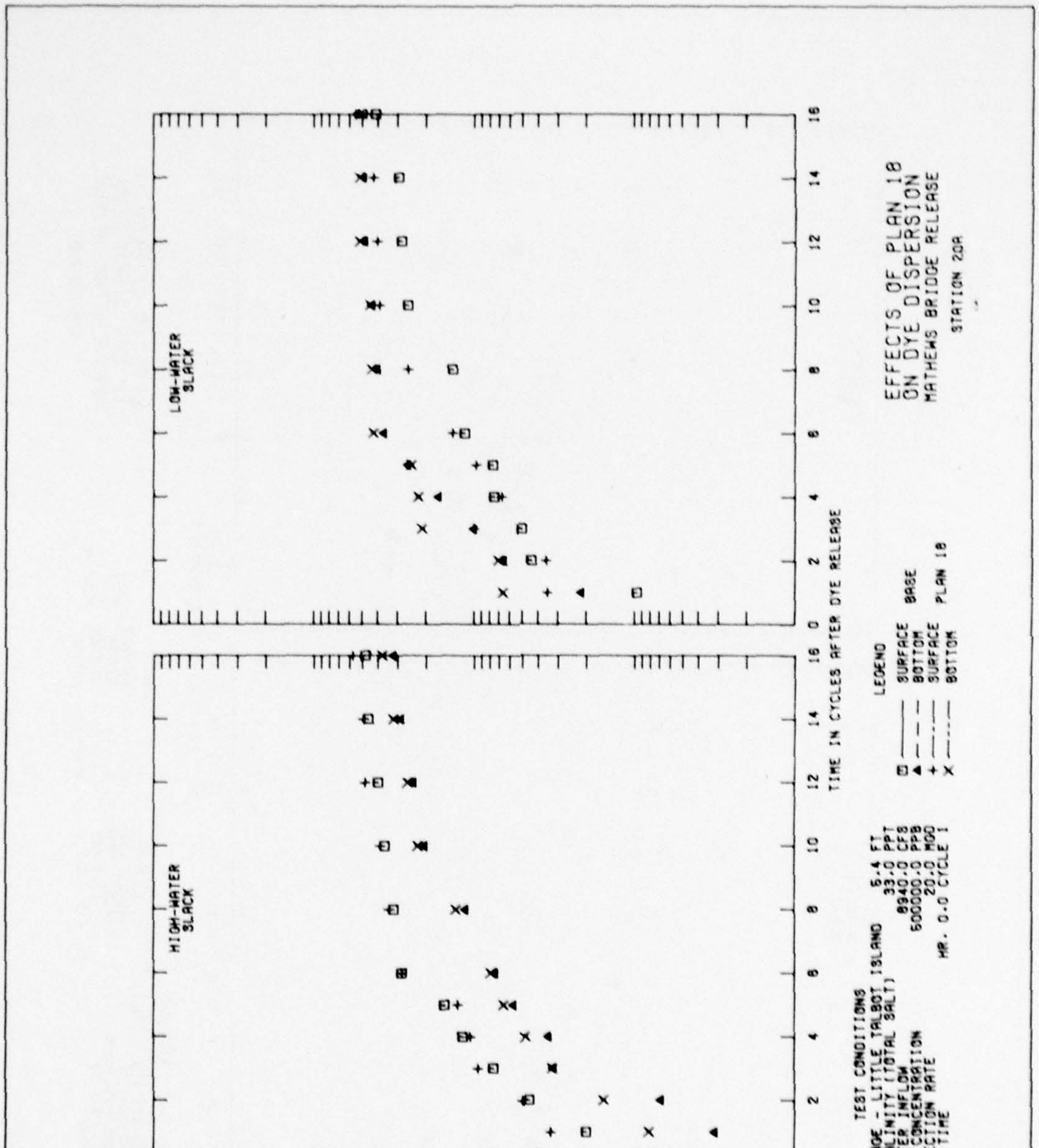
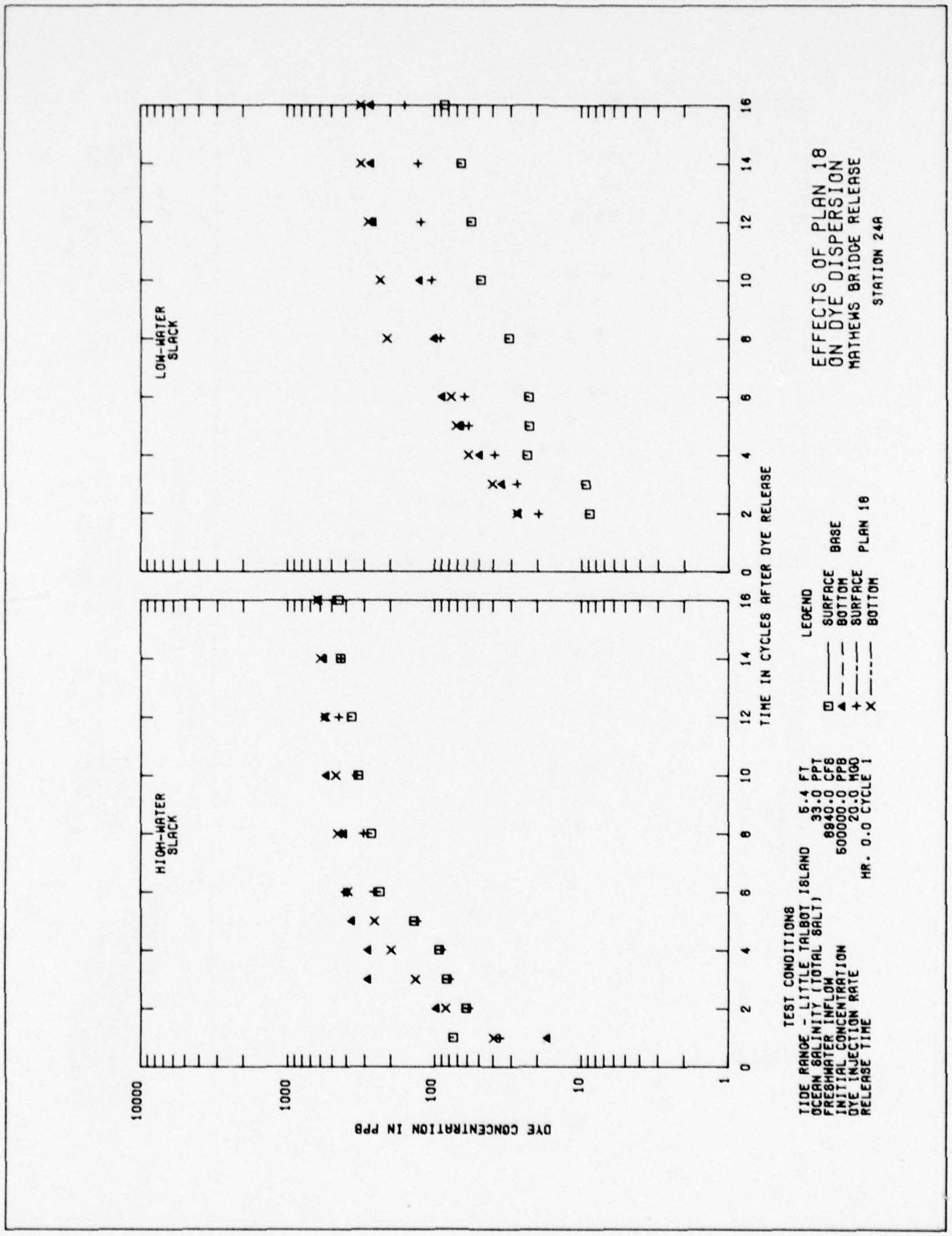

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 18
EFFECTS OF PLAN 18
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION 18A

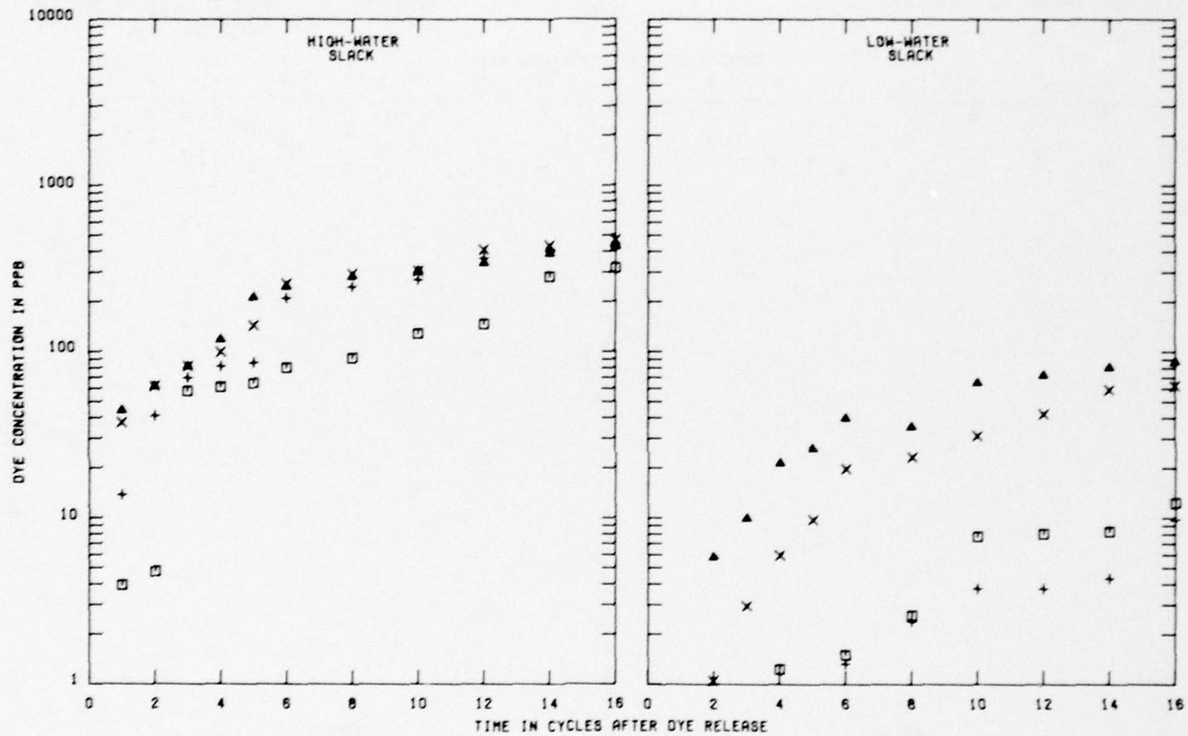
PLATE 204


EFFECTS OF PLAN 18
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION 20A
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE BASE
BOTTOM
SURFACE PLAN 18
BOTTOM



EFFECTS OF PLAN 18
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION 24A
HIGH-WATER
SLACK
LOW-WATER
SLACK
DYE CONCENTRATION IN PPB
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE BASE
BOTTOM
SURFACE PLAN 18
BOTTOM

PLATE 206



TEST CONDITIONS

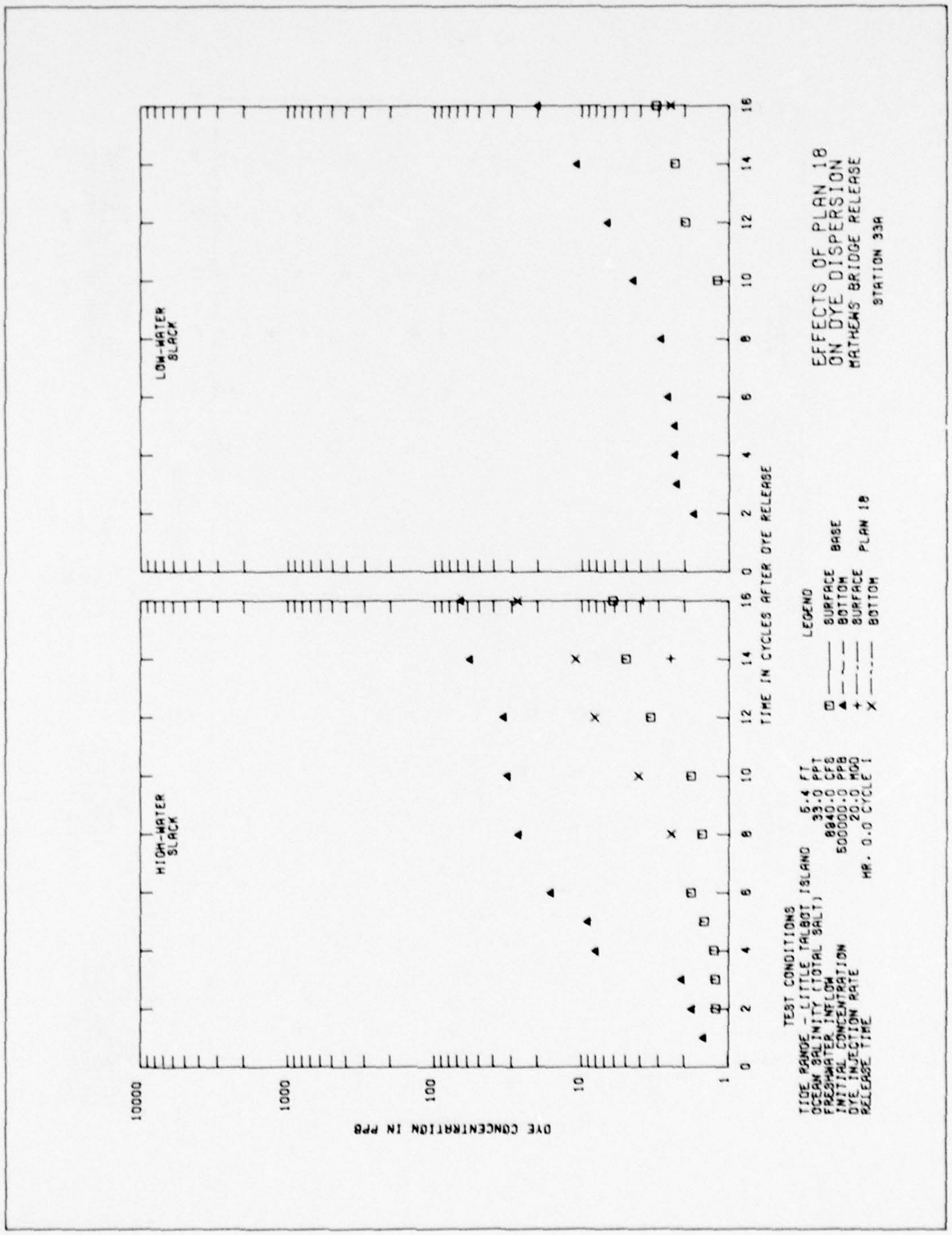
TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	20.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

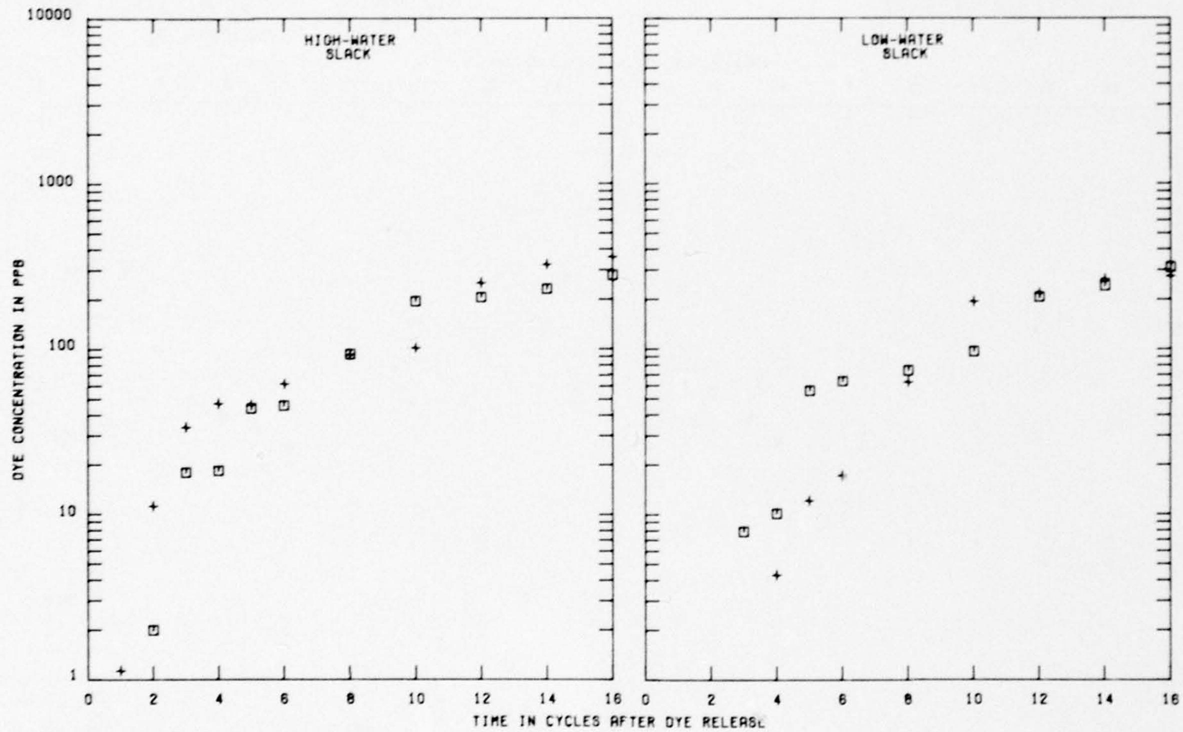
LEGEND

⊡ ———	SURFACE	BASE
▲ — — —	BOTTOM	
+ —·—	SURFACE	PLAN 18
× —··—	BOTTOM	

EFFECTS OF PLAN 18
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE

STATION 28B


HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8040.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 18
EFFECTS OF PLAN 18
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION 33A



TEST CONDITIONS

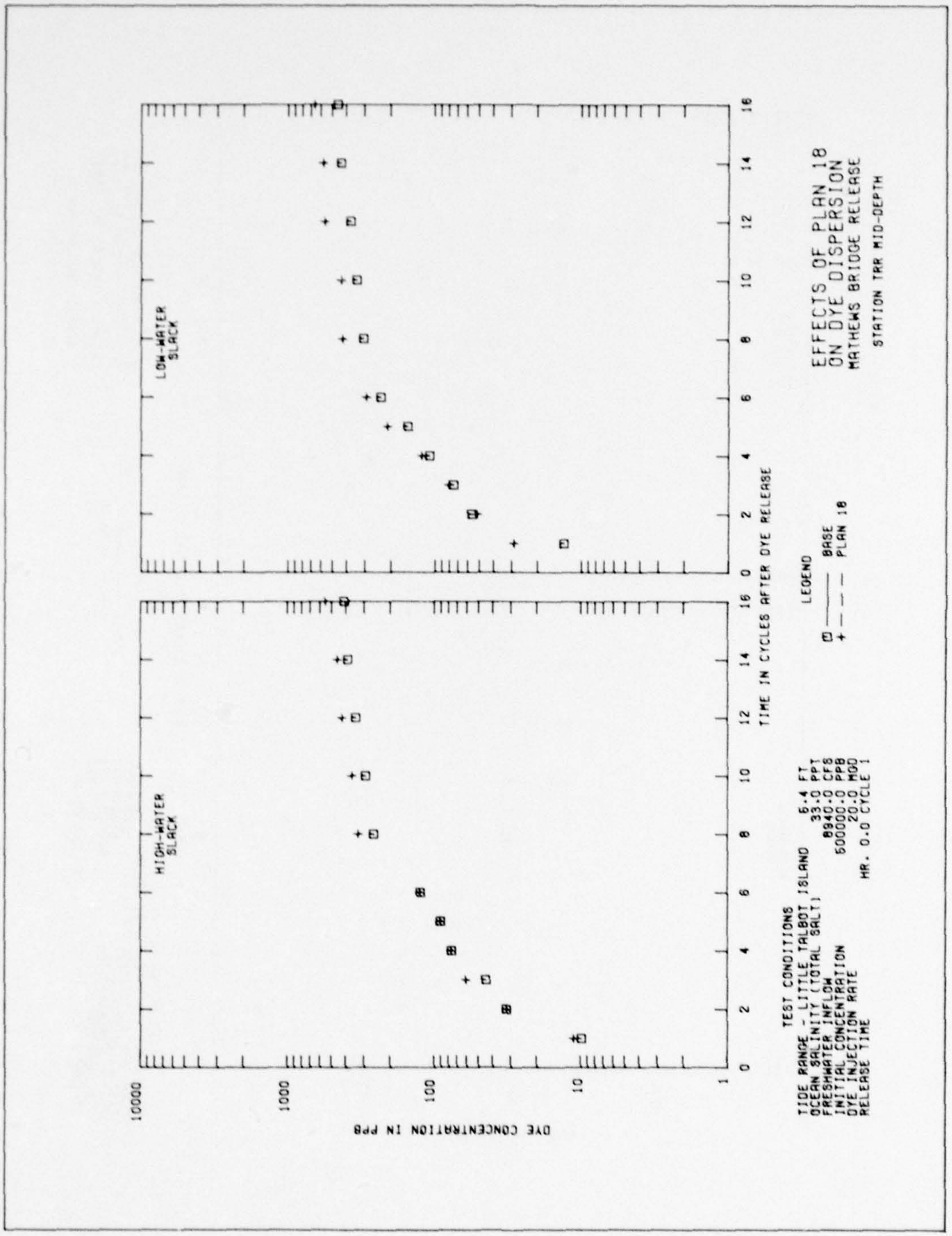
TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	20.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

⊡ ——— BASE
\+ — — — PLAN 18

EFFECTS OF PLAN 18
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE

STATION BRR MID-DEPTH


EFFECTS OF PLAN 18
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION TRR MID-DEPTH
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
TIME IN CYCLES AFTER DYE RELEASE
LEGEND
BASE
PLAN 18
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8840.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1

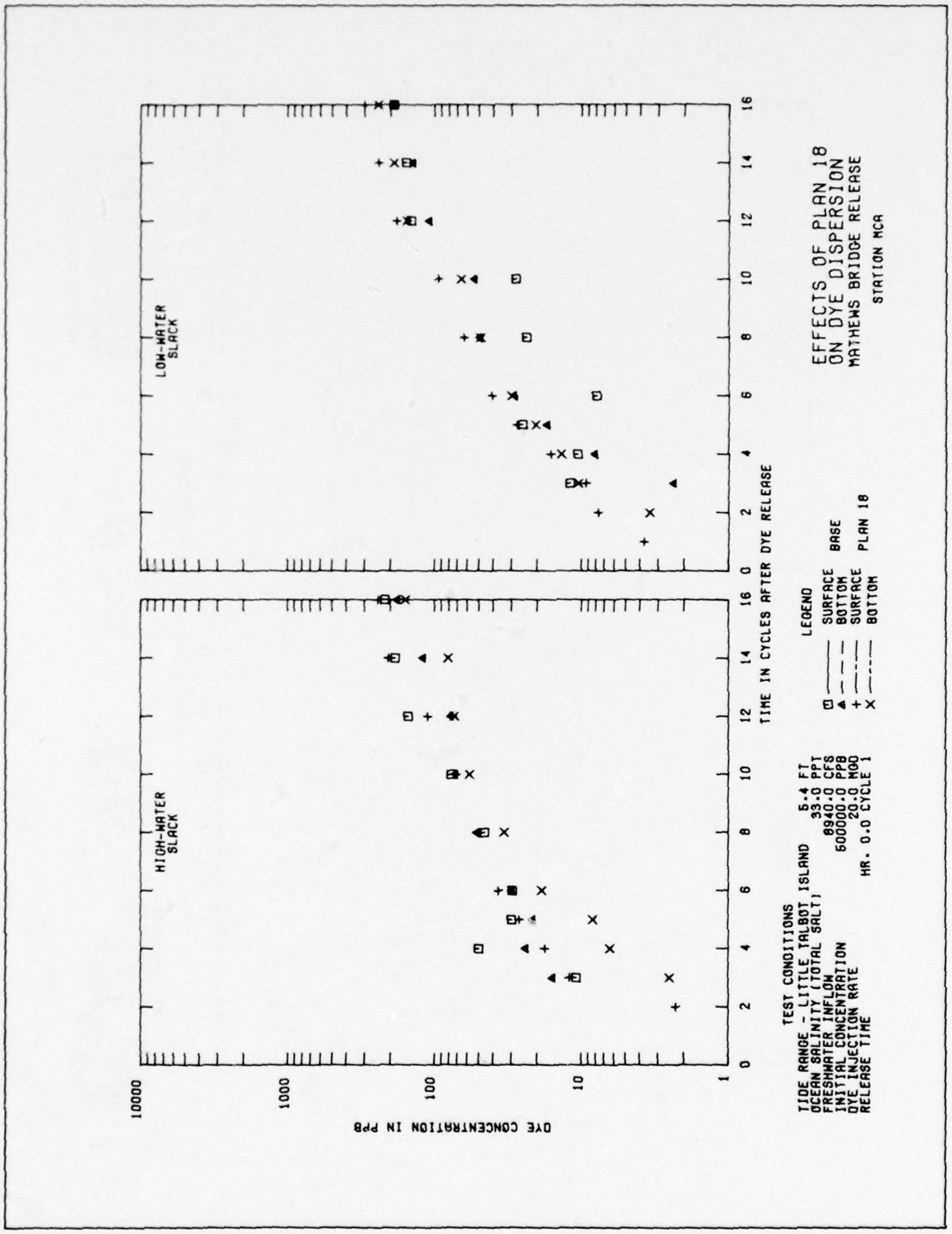

EFFECTS OF PLAN 18
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION MCA
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
TIME IN CYCLES AFTER DYE RELEASE
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MOD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 18

PLATE 211

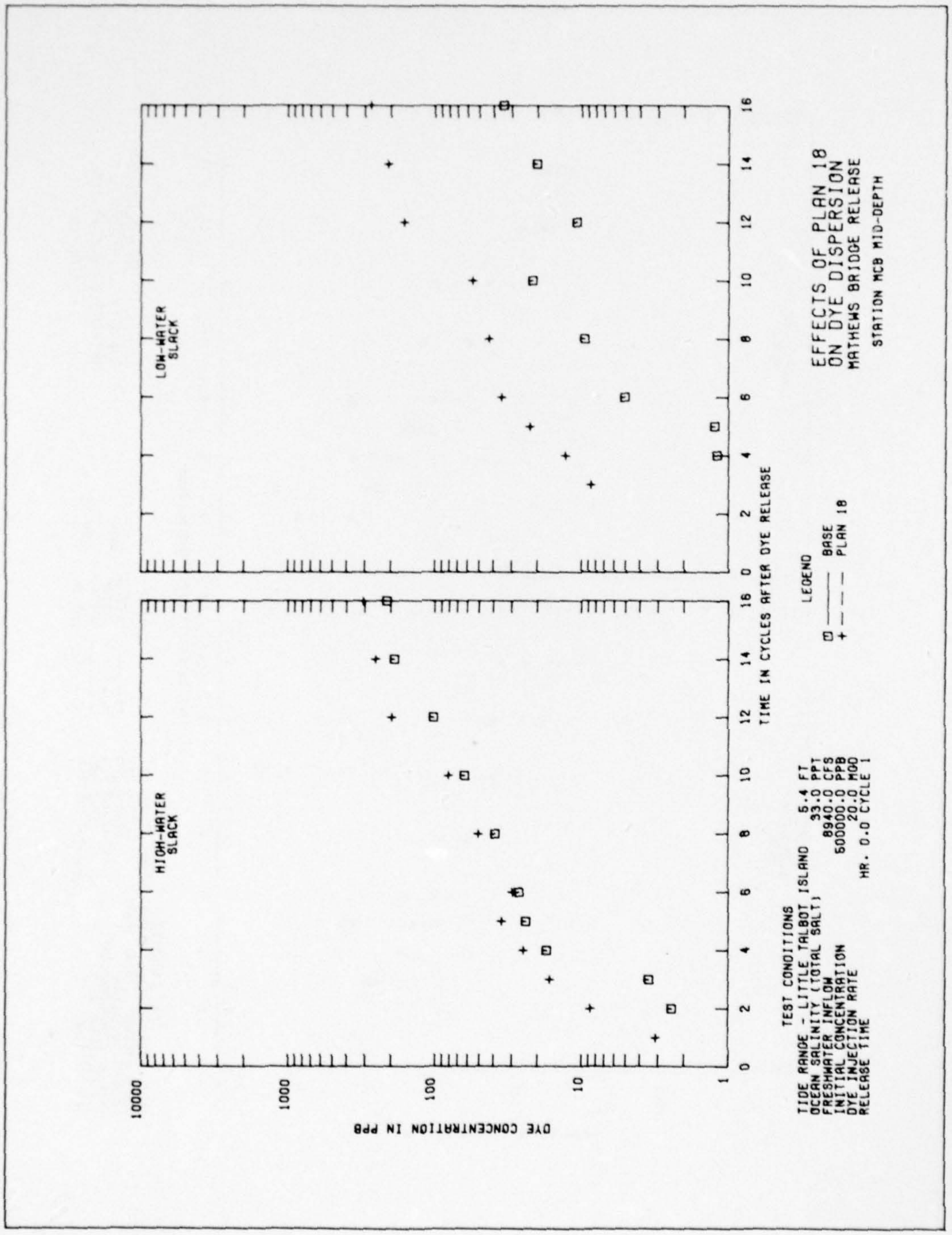

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
BASE
PLAN 18
EFFECTS OF PLAN 18
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION MCB MID-DEPTH

PLATE 212

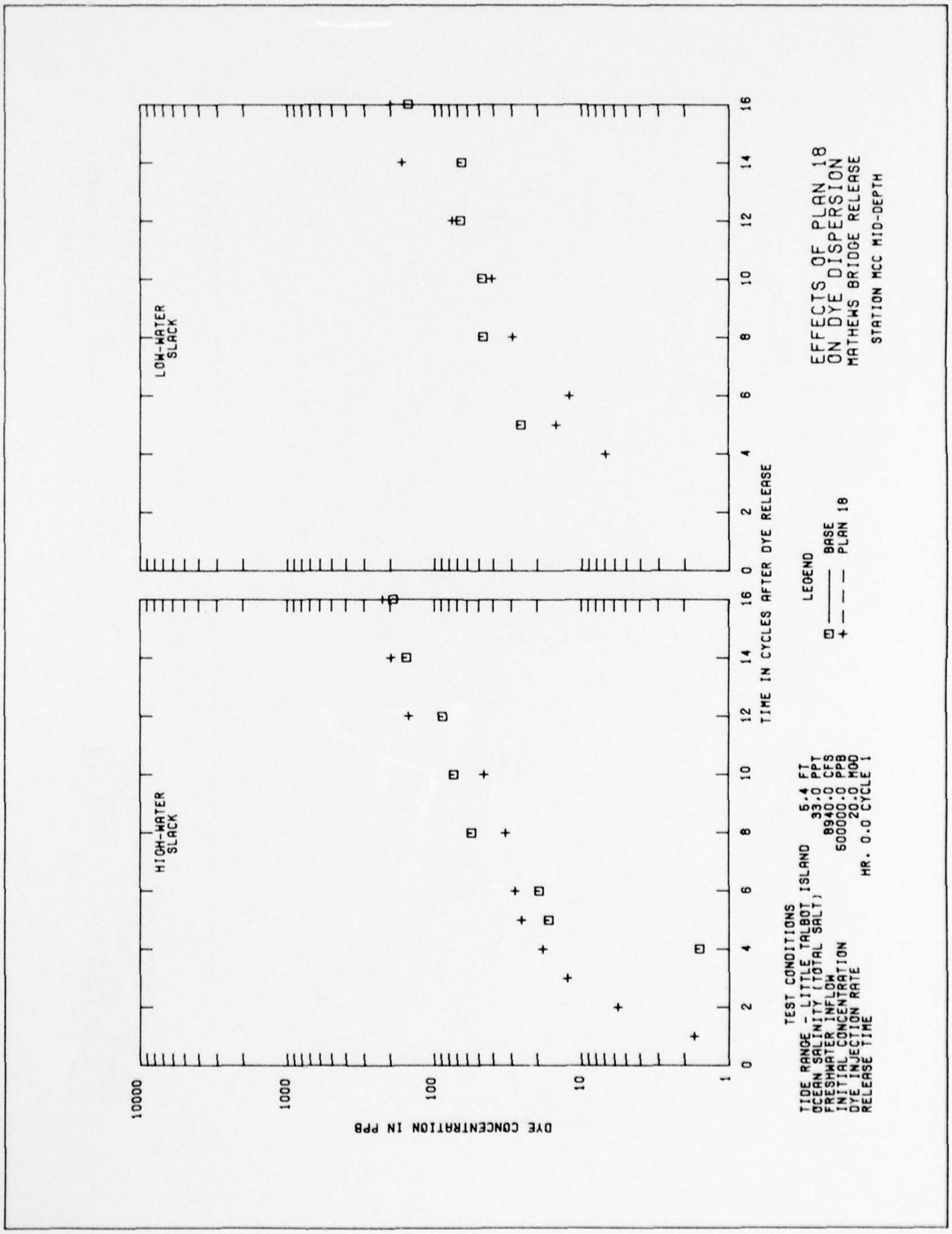
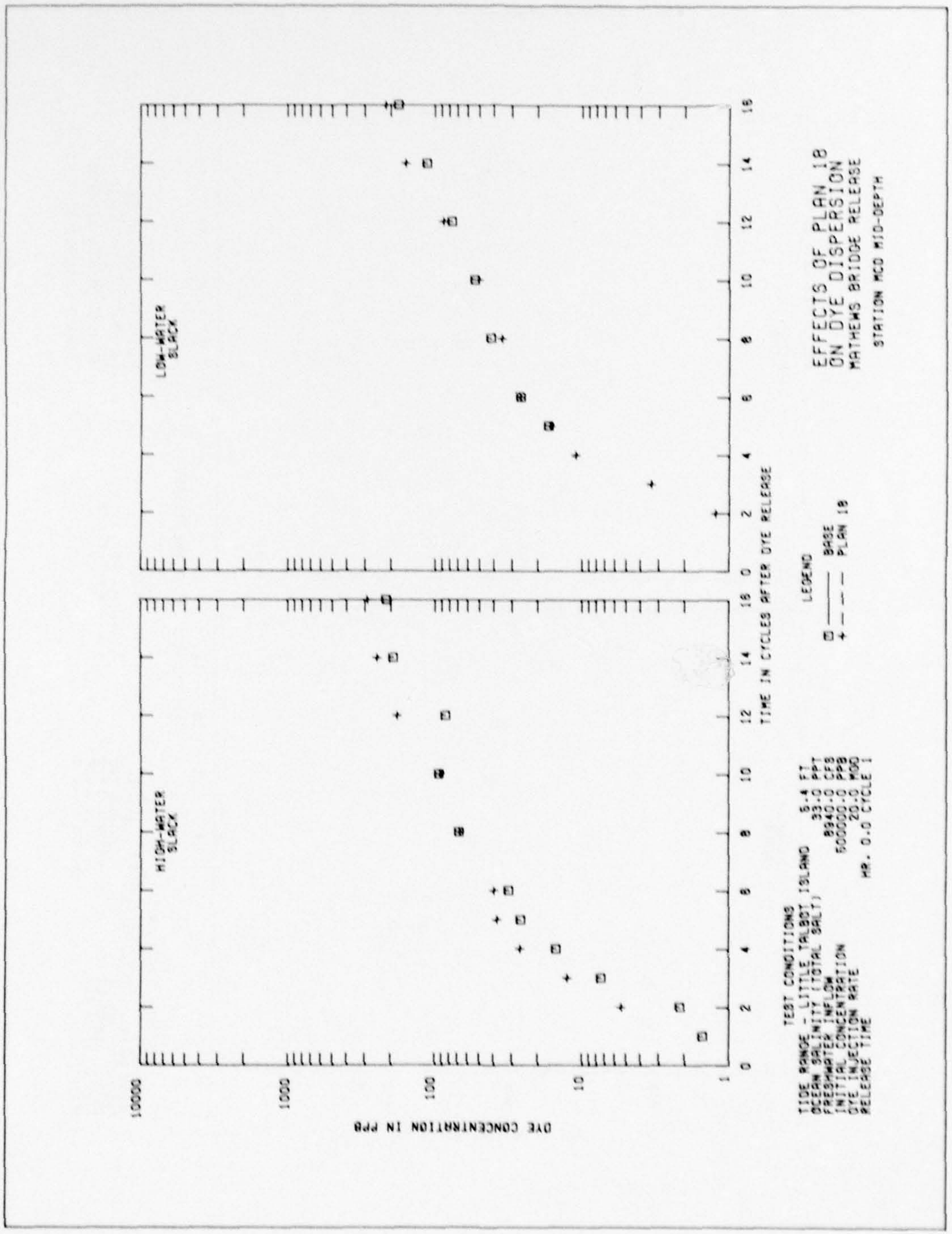
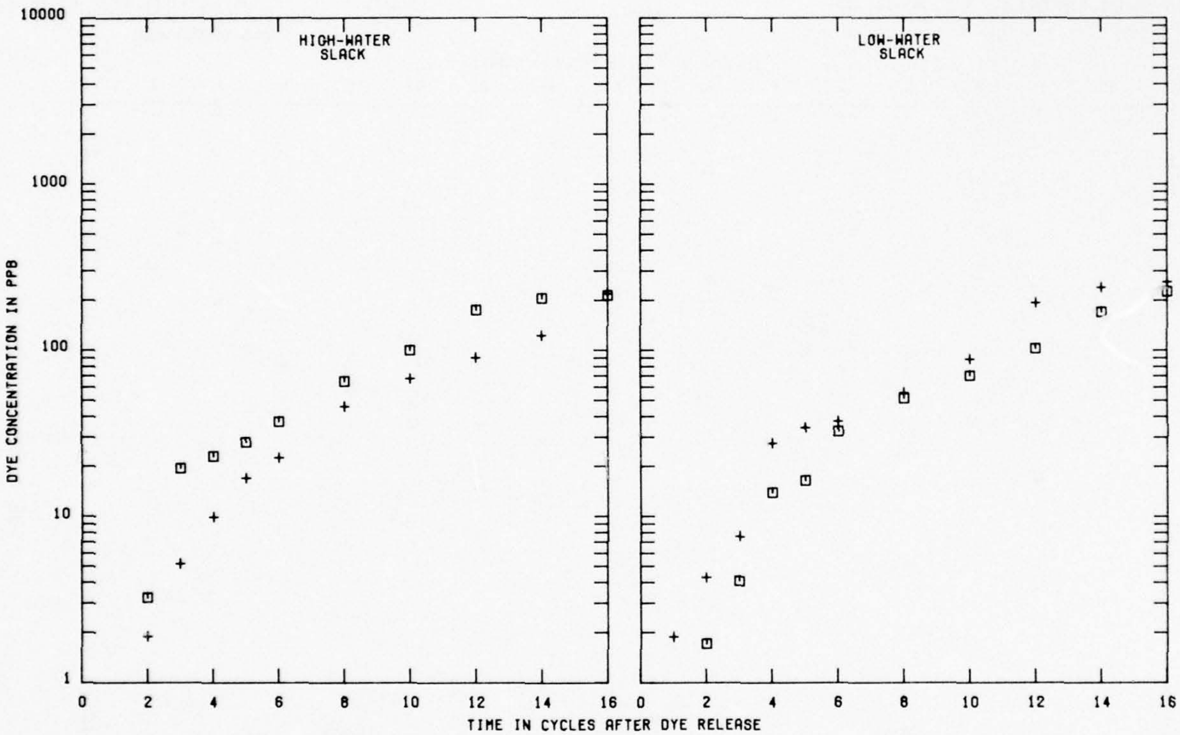

EFFECTS OF PLAN 18
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION MCC MID-DEPTH
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
TIME IN CYCLES AFTER DYE RELEASE
LEGEND
BASE
PLAN 18
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1

PLATE 213



HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
LEGEND
BASE
PLAN 18
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
EFFECTS OF PLAN 18
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION MCO MID-DEPTH

PLATE 214



TEST CONDITIONS

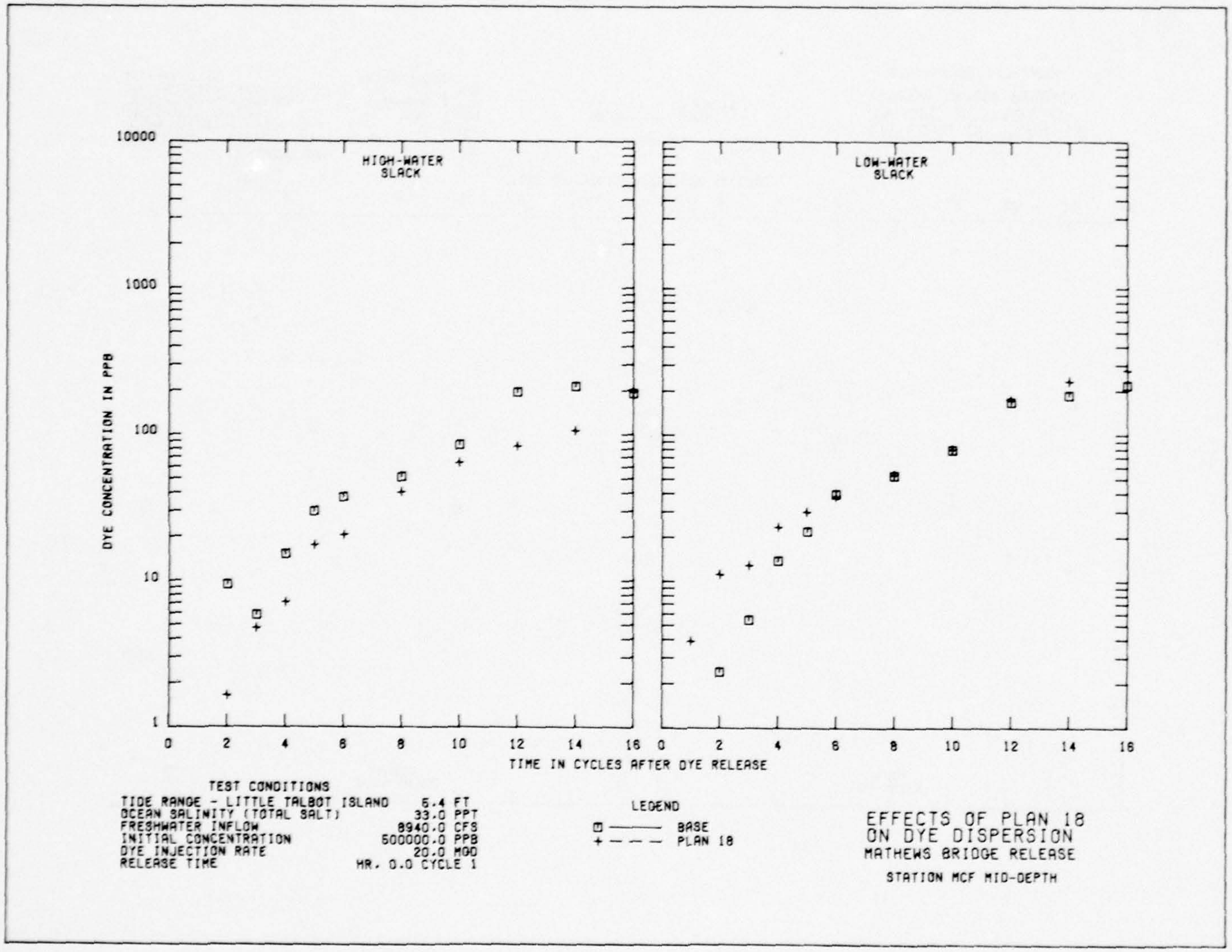
TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	20.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

⊡ ——— BASE
\+ — — — PLAN 18

EFFECTS OF PLAN 18
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE

STATION MCE MID-DEPTH



HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0 2 4 6 8 10 12 14 16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
BASE
PLAN 18
EFFECTS OF PLAN 18
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION MCF MID-DEPTH

PLATE 216

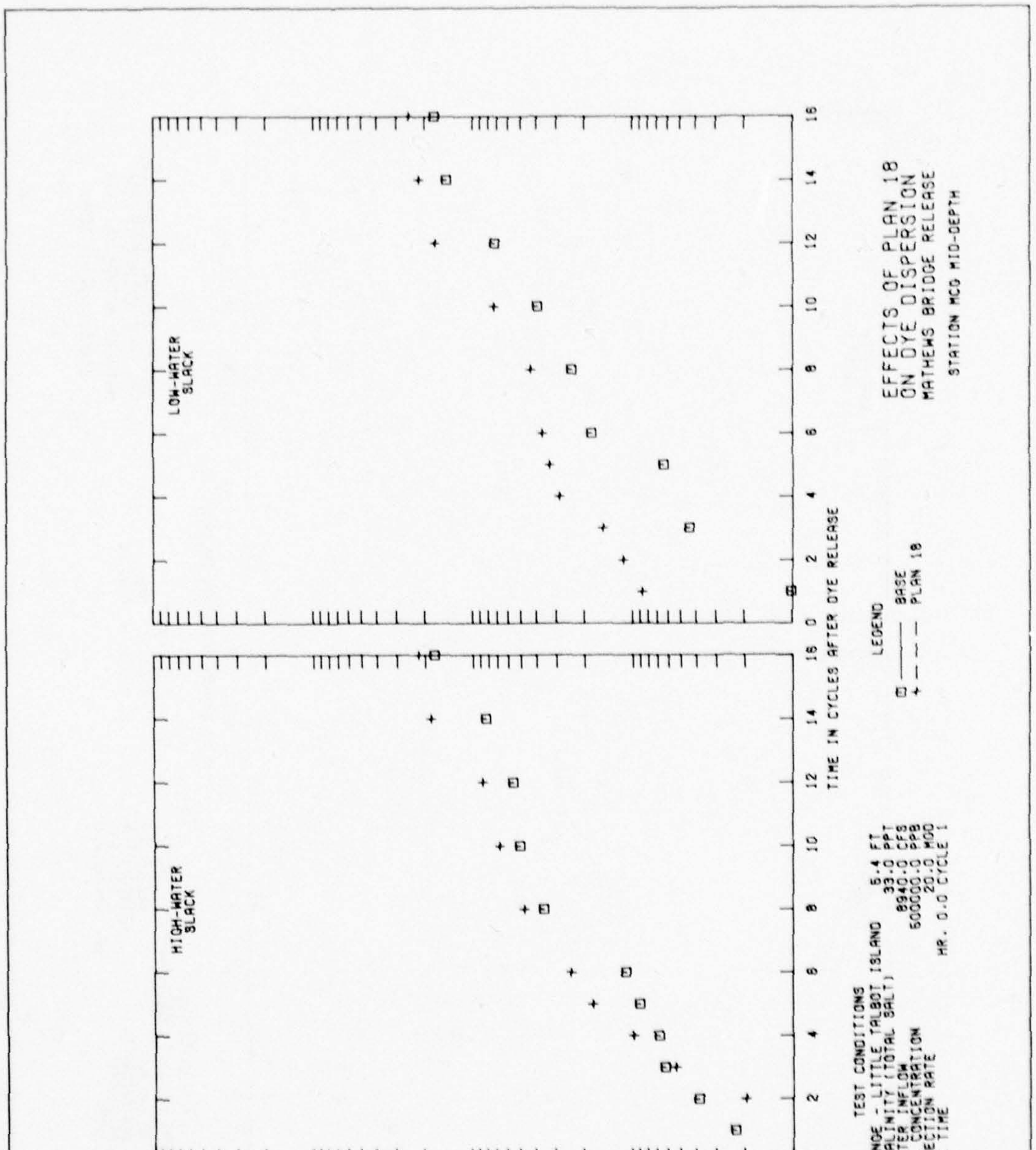
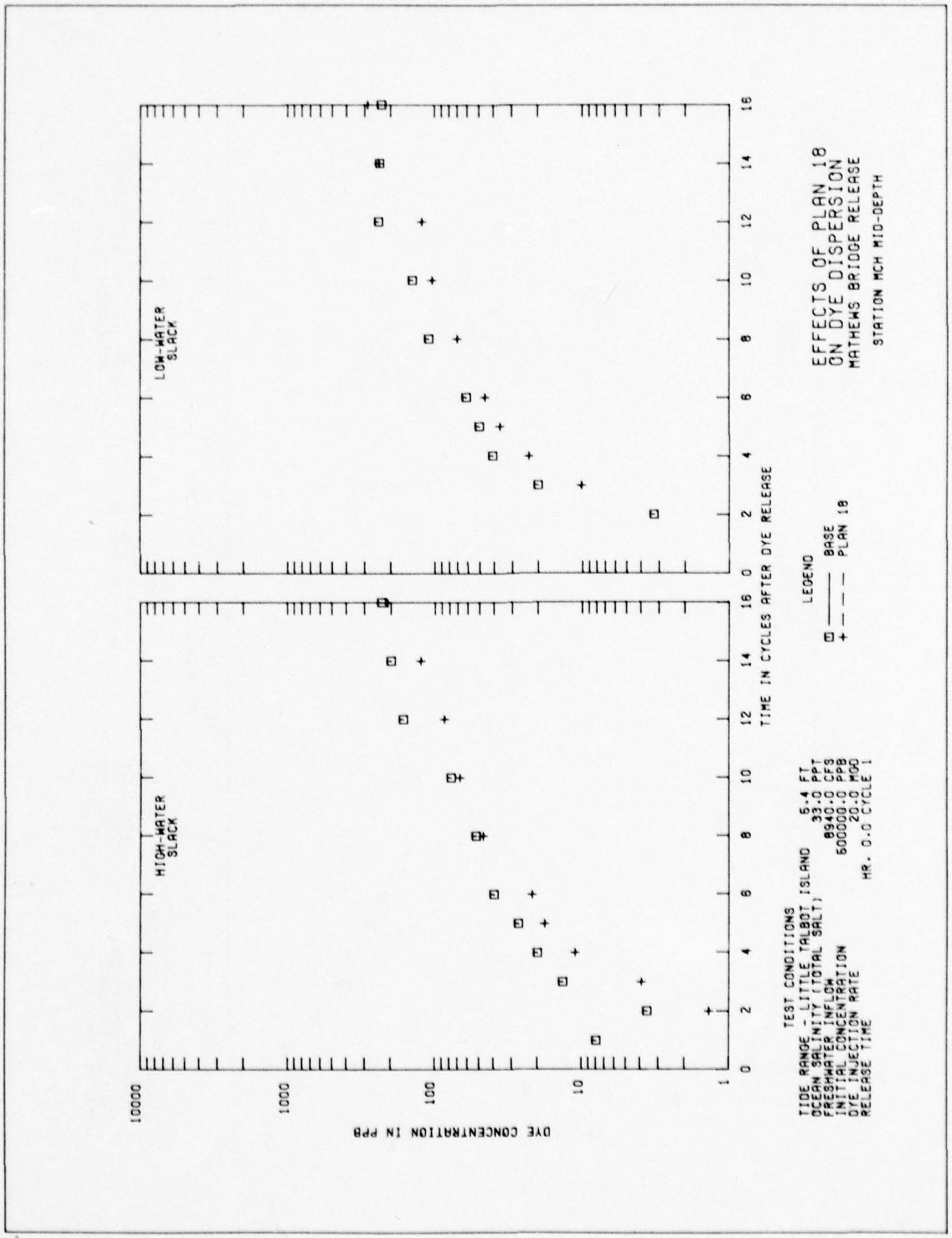
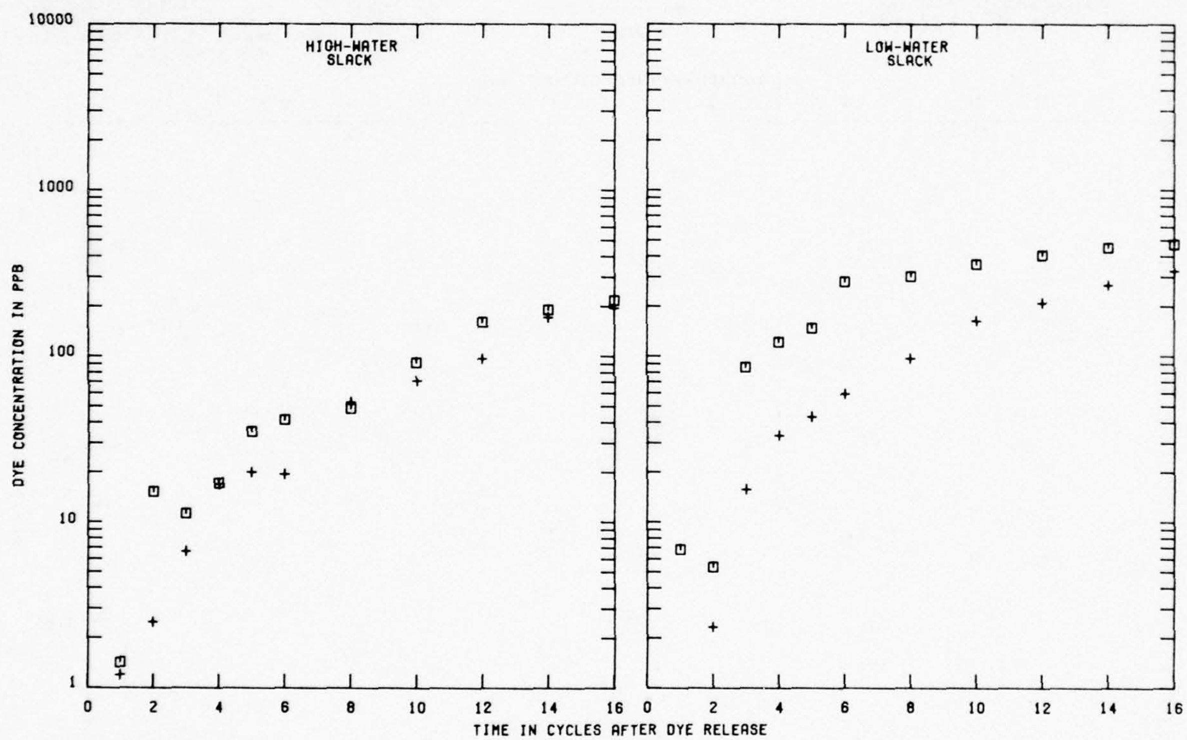

EFFECTS OF PLAN 18
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION MCO MID-DEPTH
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
TIME IN CYCLES AFTER DYE RELEASE
0
2
4
6
8
10
12
14
16
LEGEND
BASE
PLAN 18
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1

PLATE 217


EFFECTS OF PLAN 18
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION MCH MID-DEPTH
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
BASE
PLAN 18



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	6.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	20.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

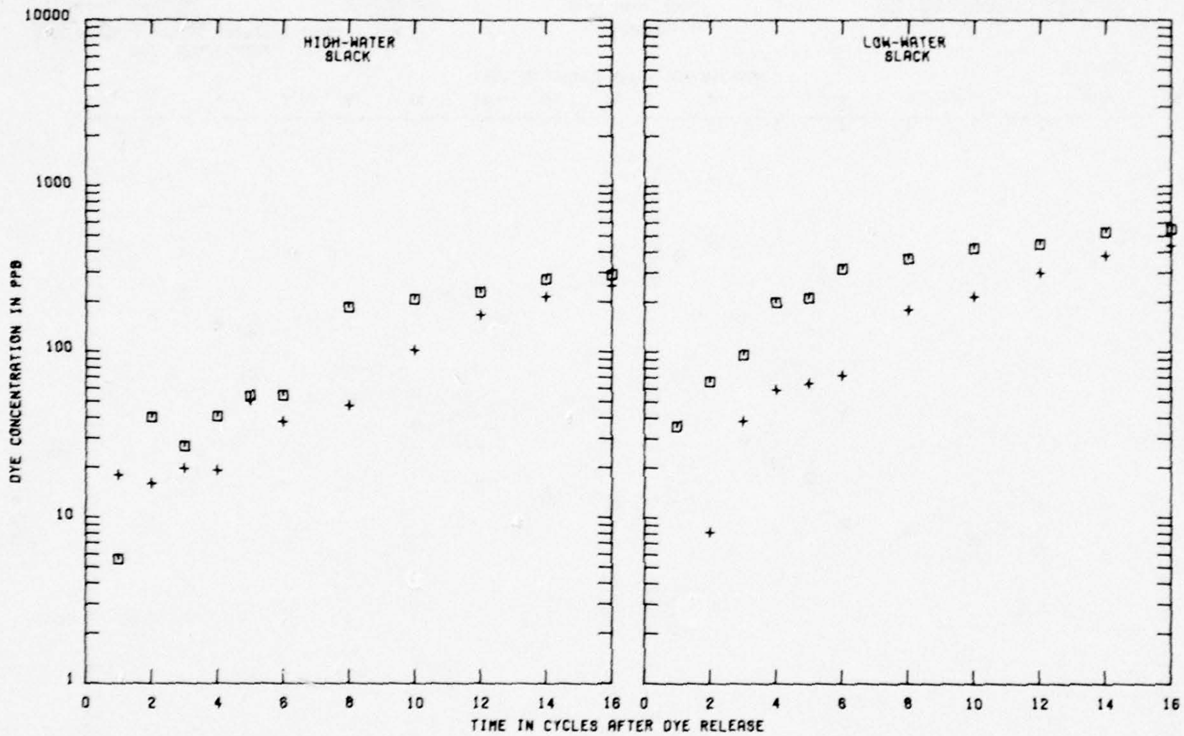
LEGEND

⊡ ——— BASE
\+ — — — PLAN 18

EFFECTS OF PLAN 18
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE

STATION MCK MID-DEPTH

PLATE 219



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	20.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

□ ——— BASE
\+ — — — PLAN 18

EFFECTS OF PLAN 18
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE

STATION MCL MID-DEPTH

PLATE 220

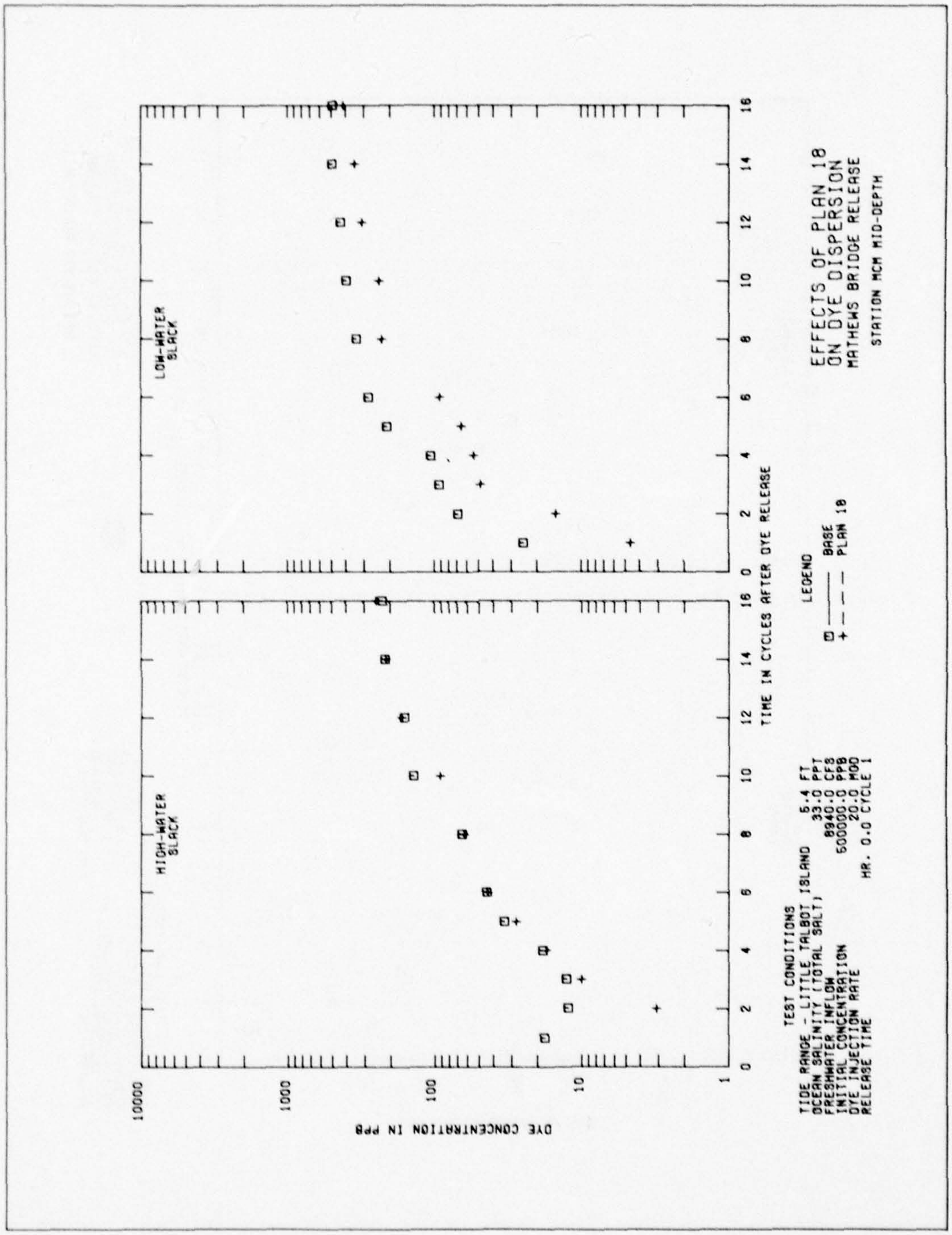
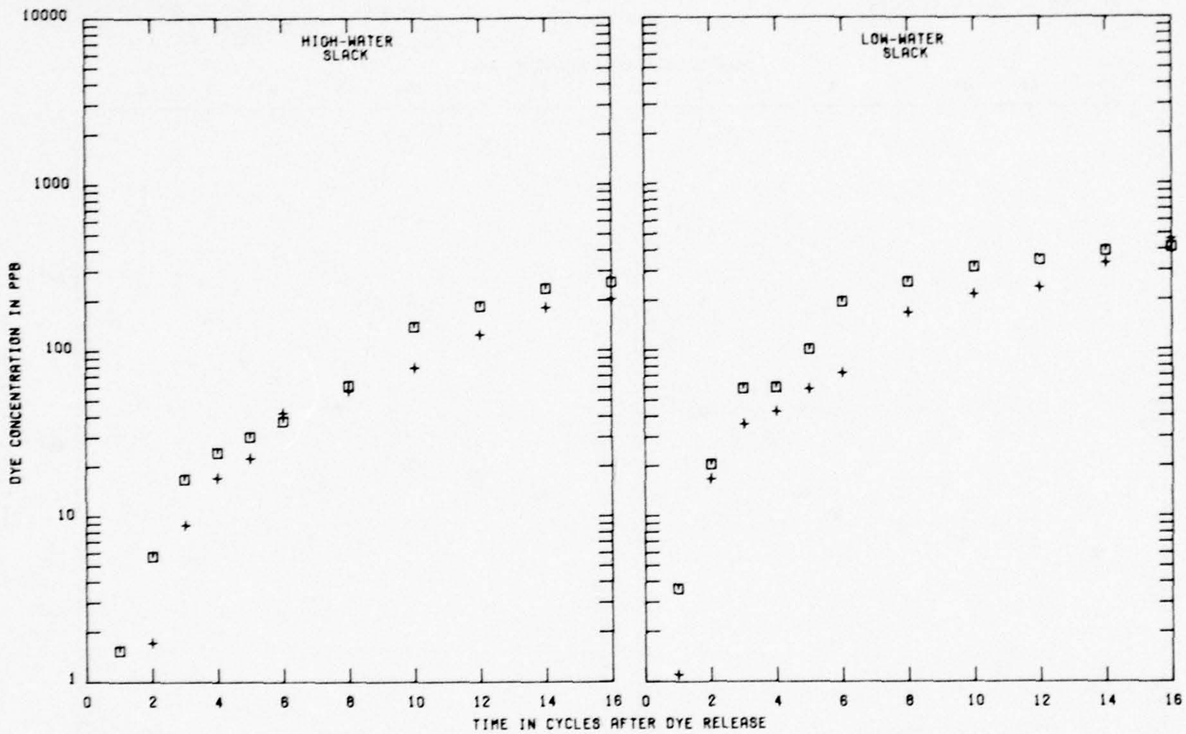

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MOD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
BASE
PLAN 18
EFFECTS OF PLAN 18
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION MCM MID-DEPTH

PLATE 221



TEST CONDITIONS

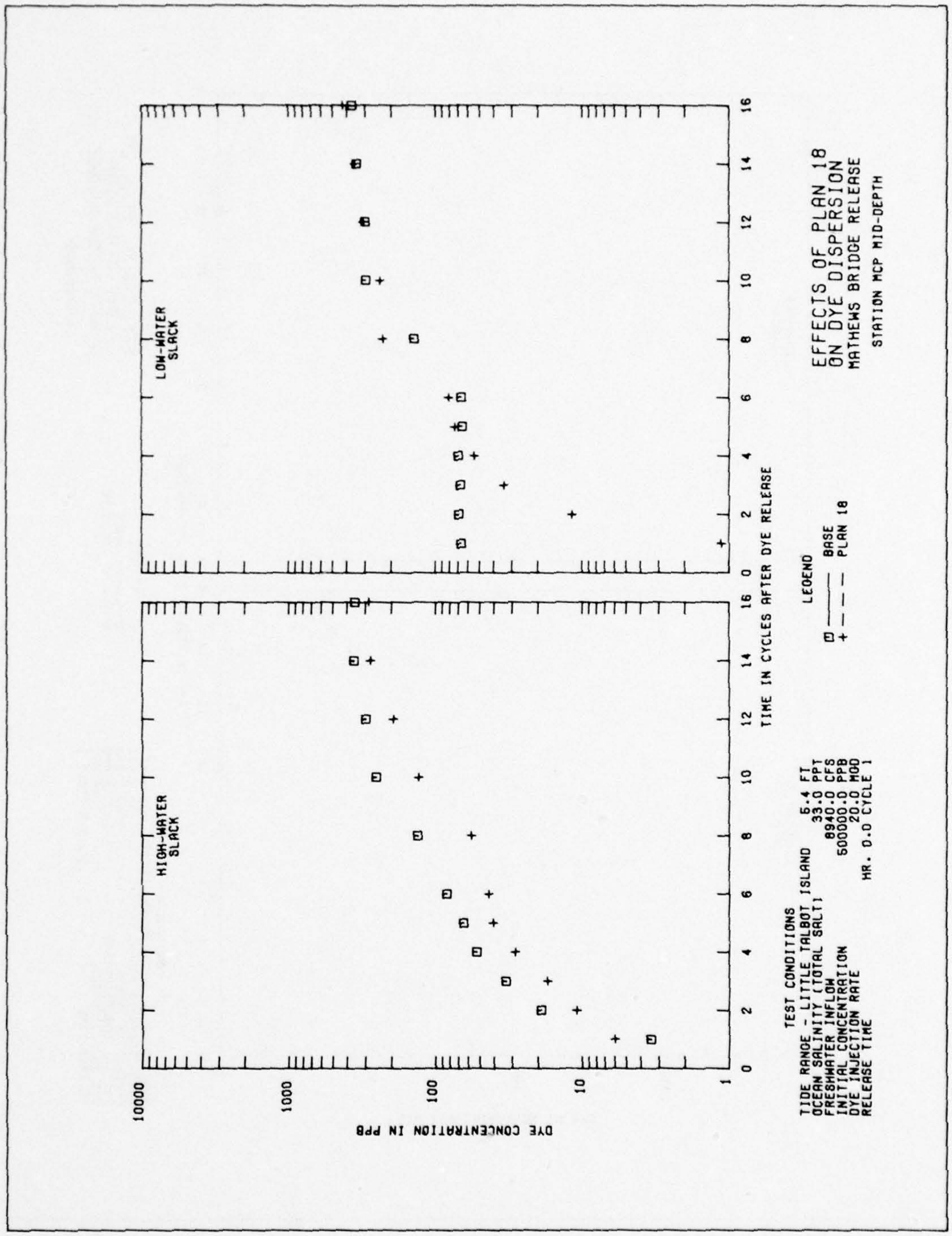
TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	20.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

⊡ ——— BASE
\+ — — — PLAN 18

EFFECTS OF PLAN 18
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE

STATION MCN MID-DEPTH



EFFECTS OF PLAN 18
ON DYE DISPERSION
MATHEWS BRIDGE RELEASE
STATION MCP MID-DEPTH
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
TIME IN CYCLES AFTER DYE RELEASE
LEGEND
BASE
PLAN 18
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1

PLATE 223

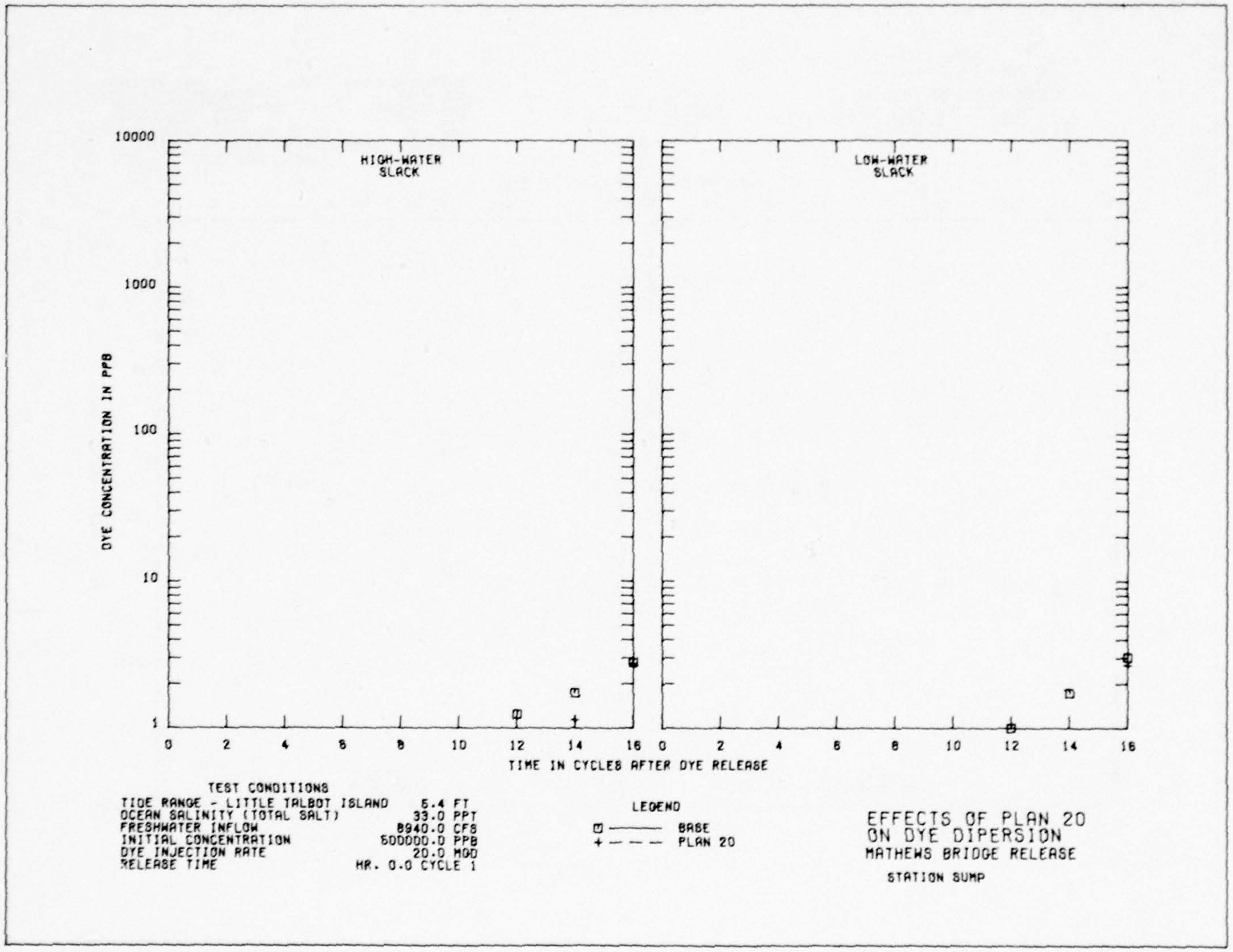

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0 2 4 6 8 10 12 14 16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
BASE
PLAN 20
EFFECTS OF PLAN 20
ON DYE DIPERSION
MATHEWS BRIDGE RELEASE
STATION SUMP

PLATE 224

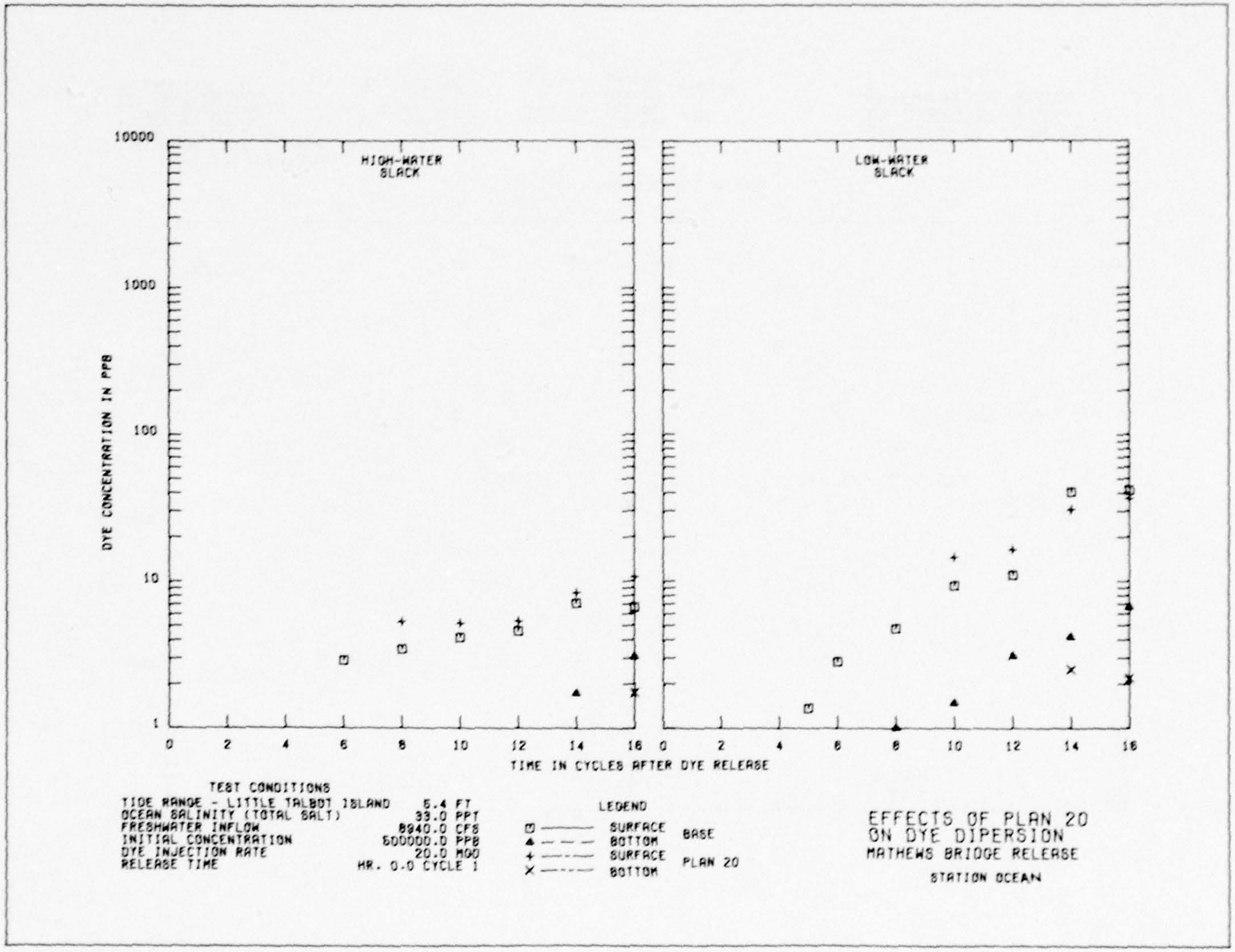
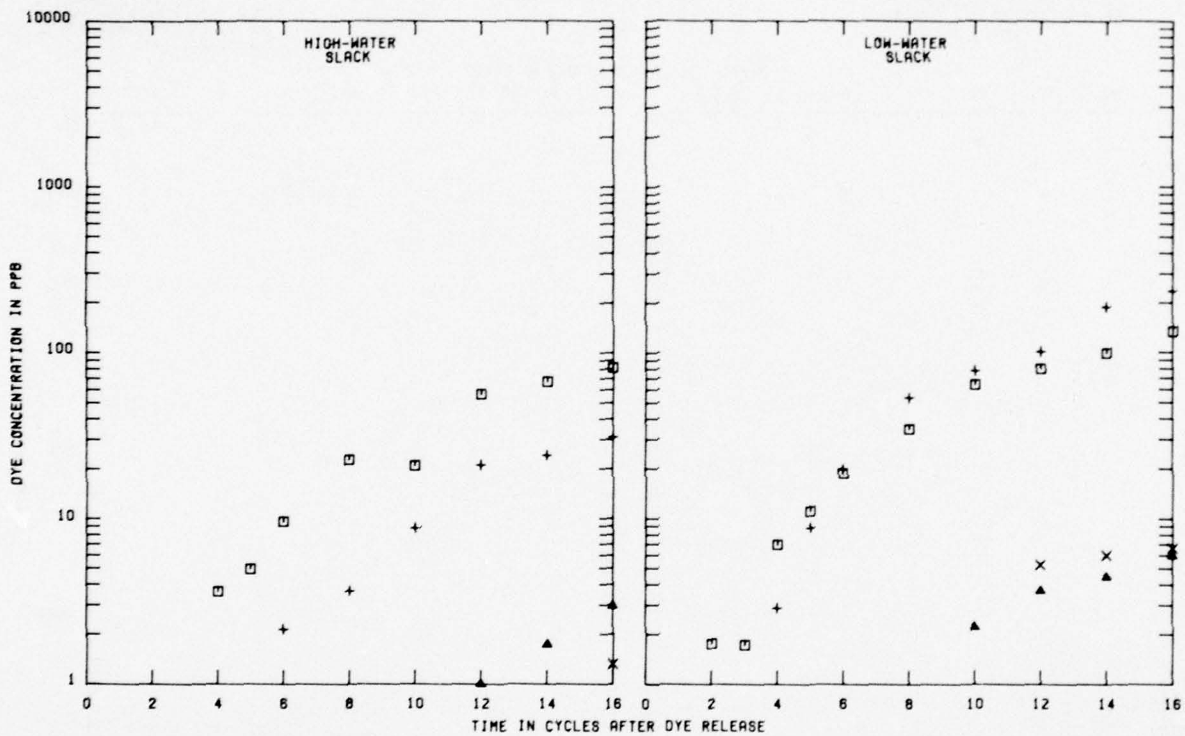

HIGH-WATER
SLACK
LOW-WATER
SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 20
EFFECTS OF PLAN 20
ON DYE DIPERSION
MATHEWS BRIDGE RELEASE
STATION OCEAN

PLATE 225



TEST CONDITIONS

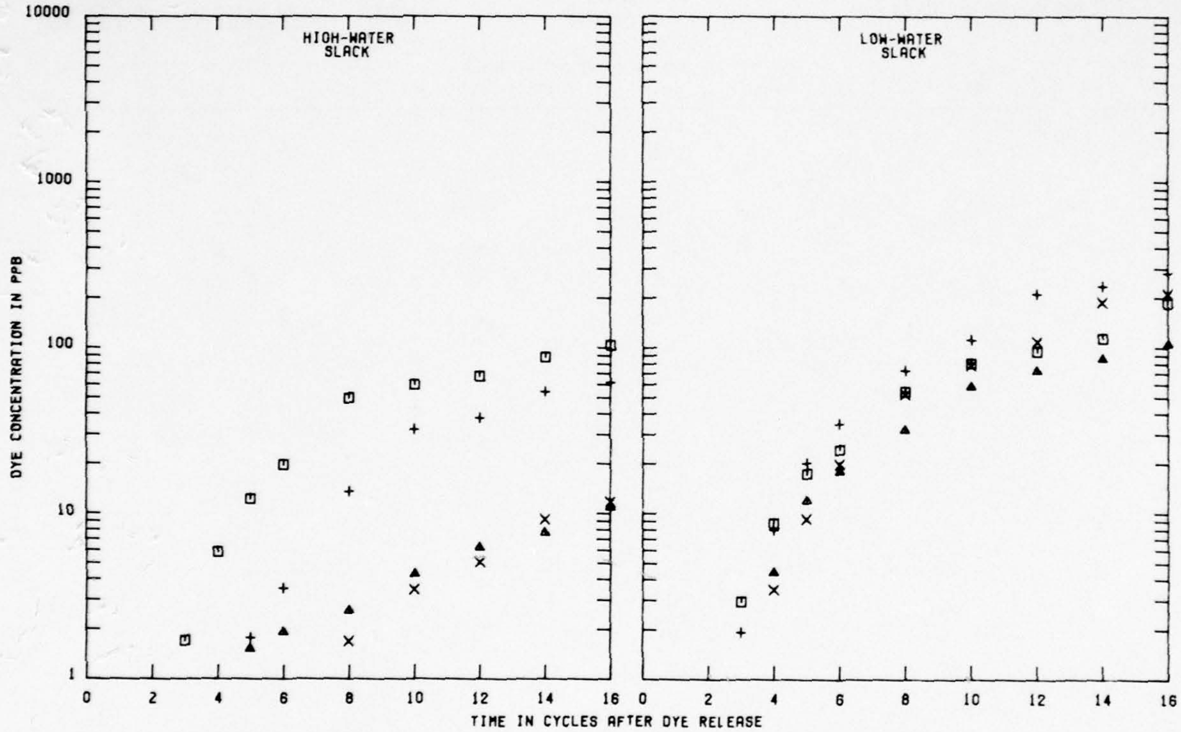
TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	20.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

⊡ ——— SURFACE BASE
▲ — — BOTTOM BASE
+ —·— SURFACE PLAN 20
× —··— BOTTOM PLAN 20

EFFECTS OF PLAN 20
ON DYE DIPERSION
MATHEWS BRIDGE RELEASE

STATION 08



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	20.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

⊡ ———	SURFACE	BASE
▲ — — —	BOTTOM	
+ —·—	SURFACE	PLAN 20
× —··—	BOTTOM	

EFFECTS OF PLAN 20
ON DYE DIPERSION
MATHEWS BRIDGE RELEASE

STATION 3A

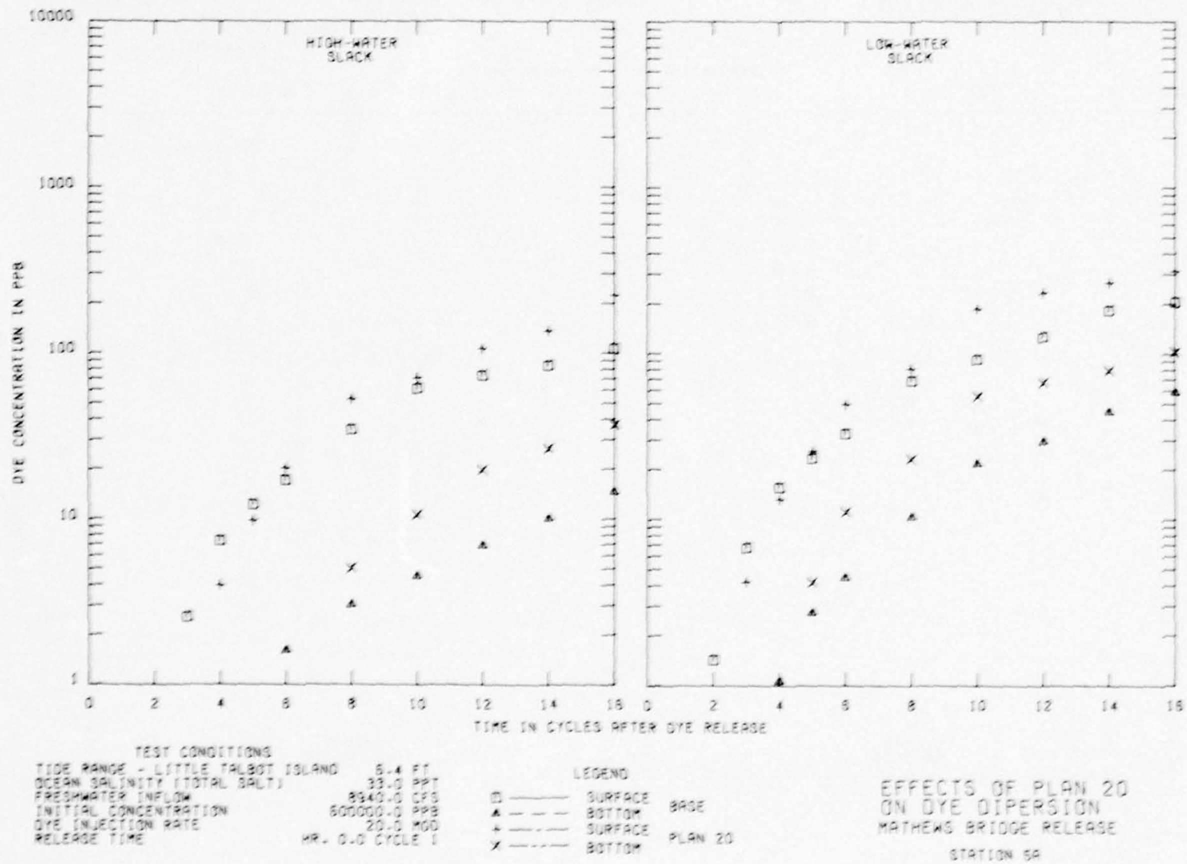
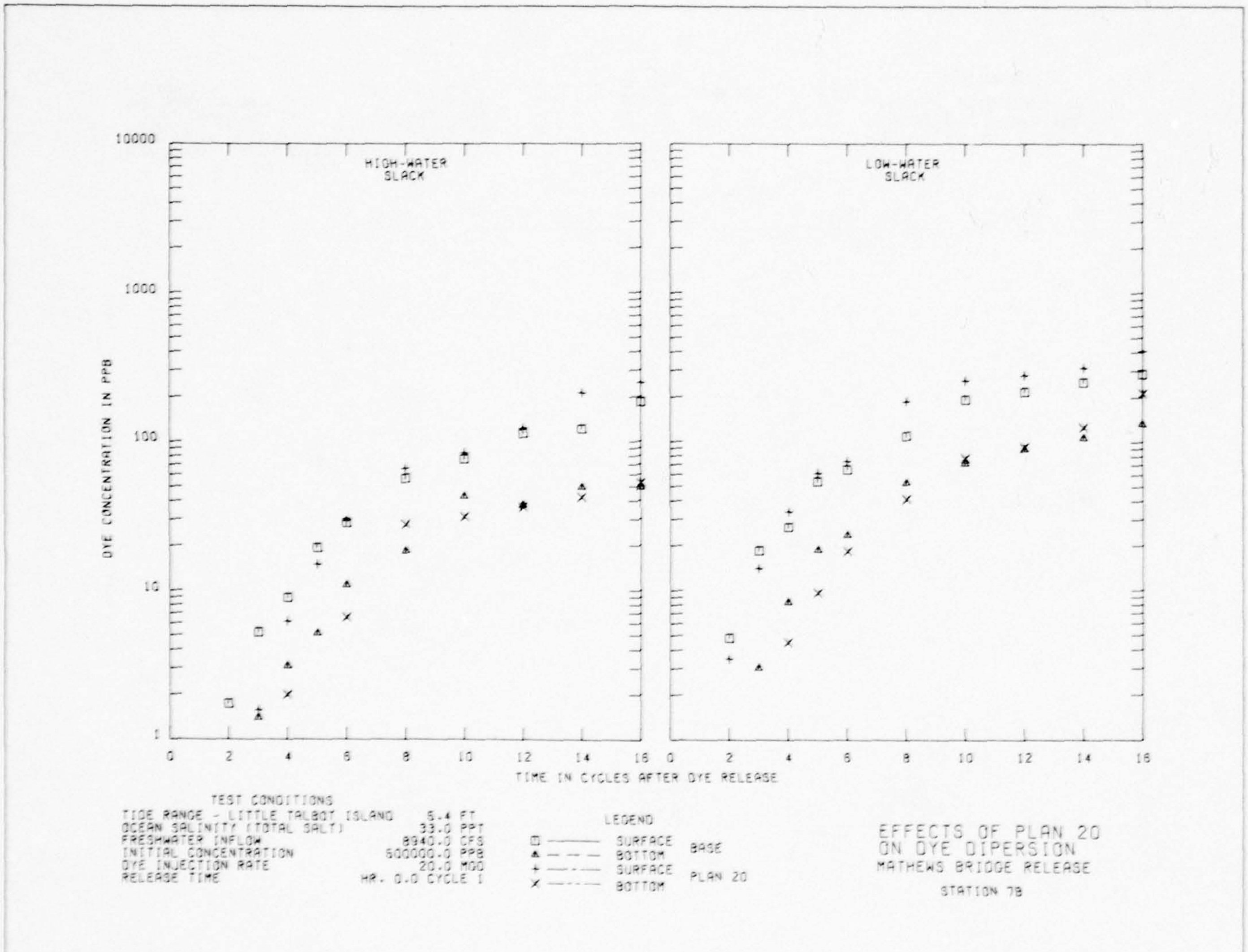
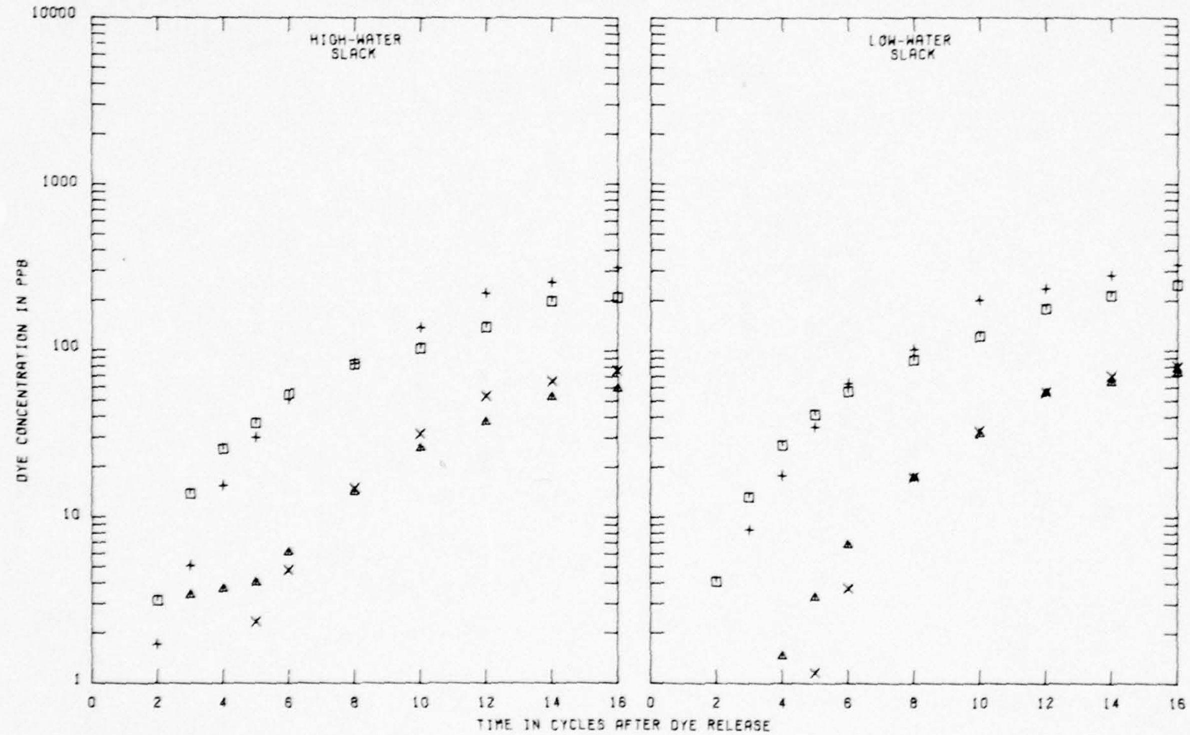

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 20
EFFECTS OF PLAN 20
ON DYE DIPERSION
MATHEWS BRIDGE RELEASE
STATION 5A

PLATE 228


HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE BASE
BOTTOM
SURFACE PLAN 20
BOTTOM
EFFECTS OF PLAN 20
ON DYE DIPERSION
MATHEWS BRIDGE RELEASE
STATION 7B



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	20.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

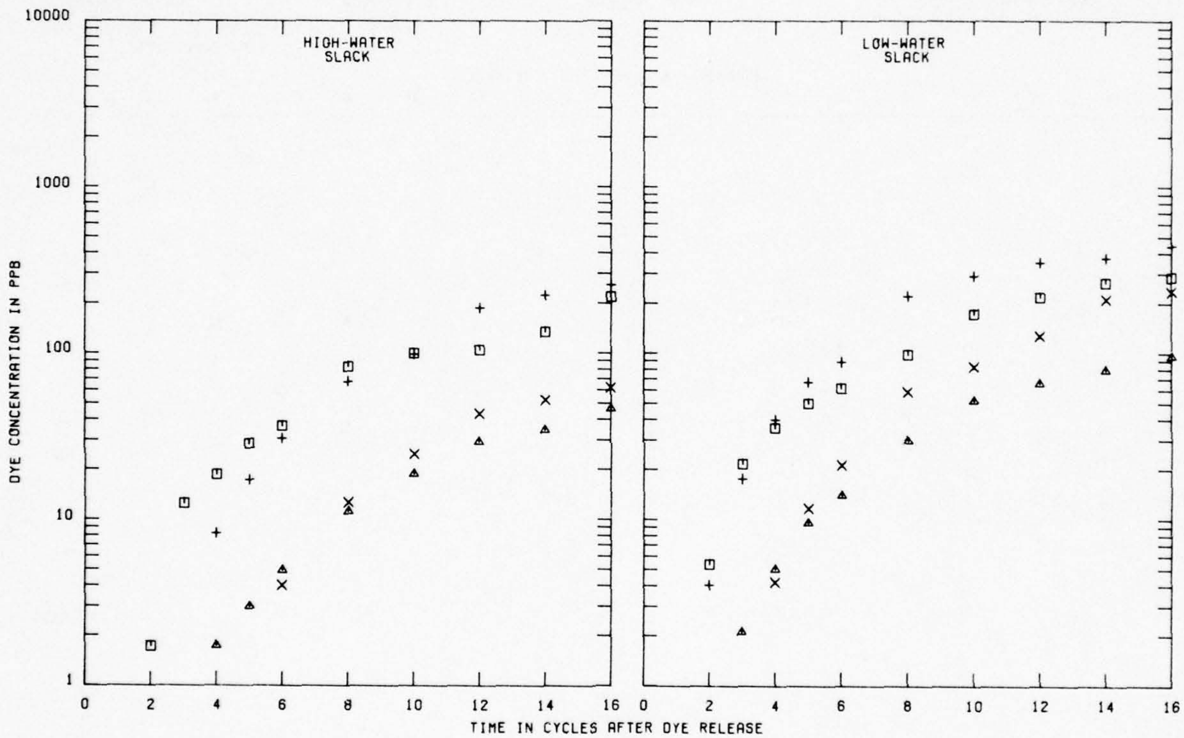
LEGEND

- ⊡ SURFACE — BASE
- ▲ BOTTOM — BASE
- \+ SURFACE — PLAN 20
- × BOTTOM — PLAN 20

EFFECTS OF PLAN 20
ON DYE DIPERSION
MATHEWS BRIDGE RELEASE

STATION 9AB

PLATE 230



TEST CONDITIONS

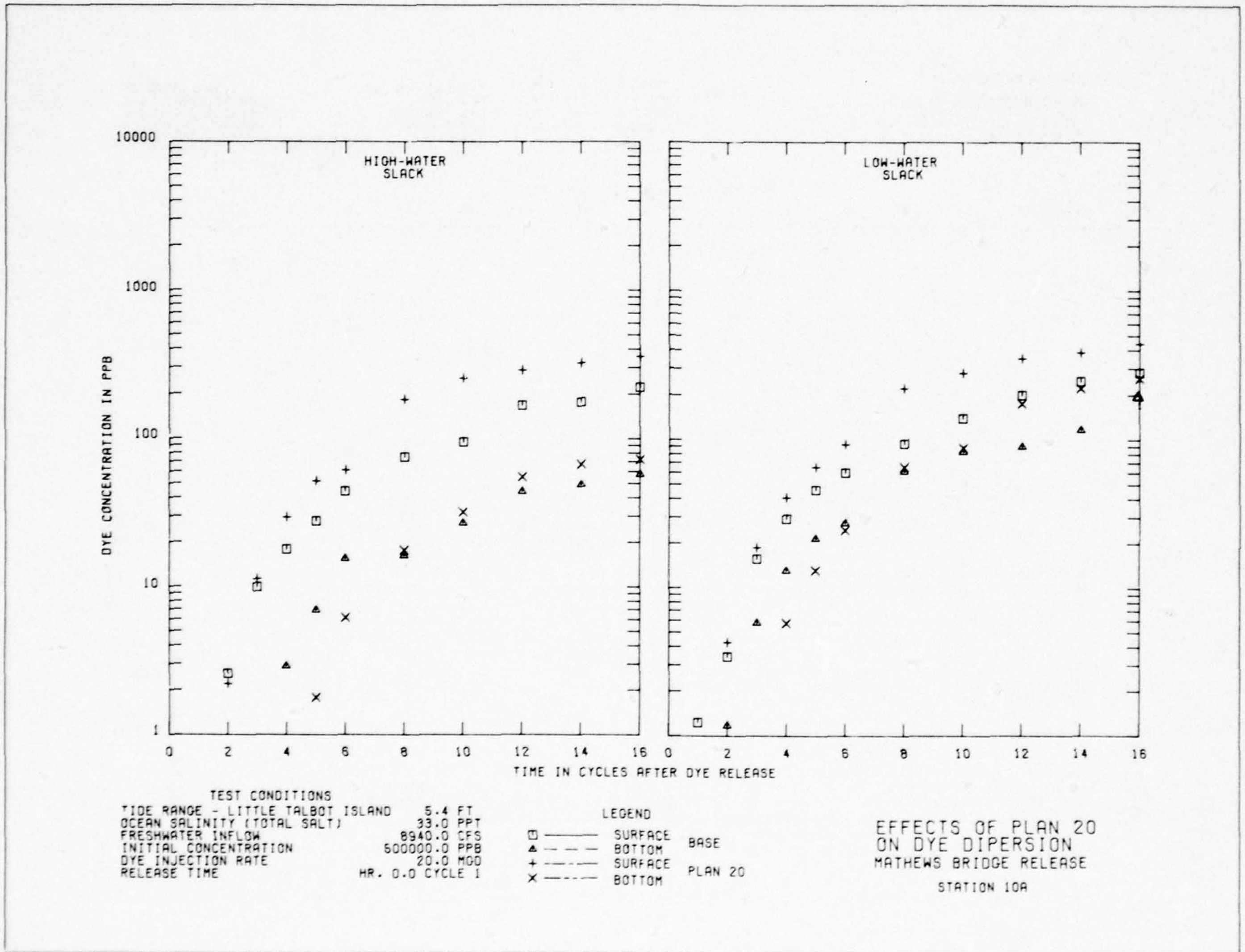
TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	20.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

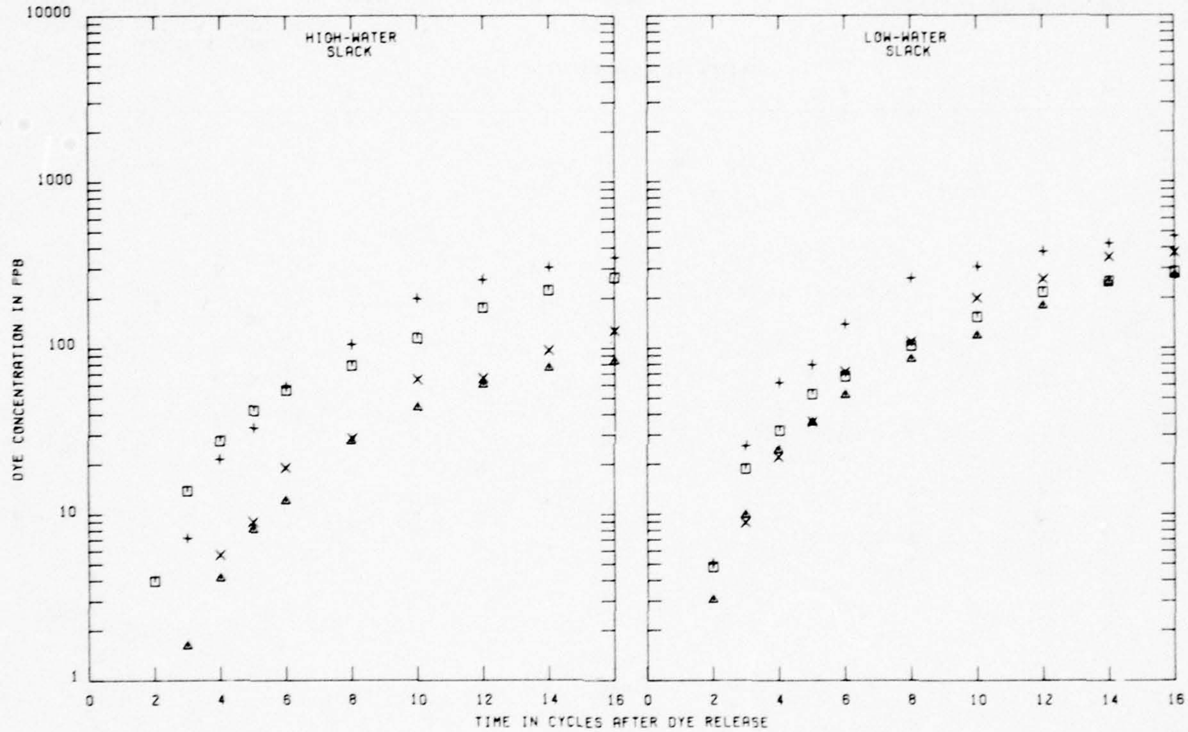
LEGEND

⊡ ———	SURFACE	BASE
▲ — — —	BOTTOM	
+ —·—	SURFACE	PLAN 20
× —··—	BOTTOM	

EFFECTS OF PLAN 20
ON DYE DIPERSION
MATHEWS BRIDGE RELEASE

STATION 9B


HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 20
EFFECTS OF PLAN 20
ON DYE DIPERSION
MATHEWS BRIDGE RELEASE
STATION 10A



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	600000.0 PPB
DYE INJECTION RATE	20.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

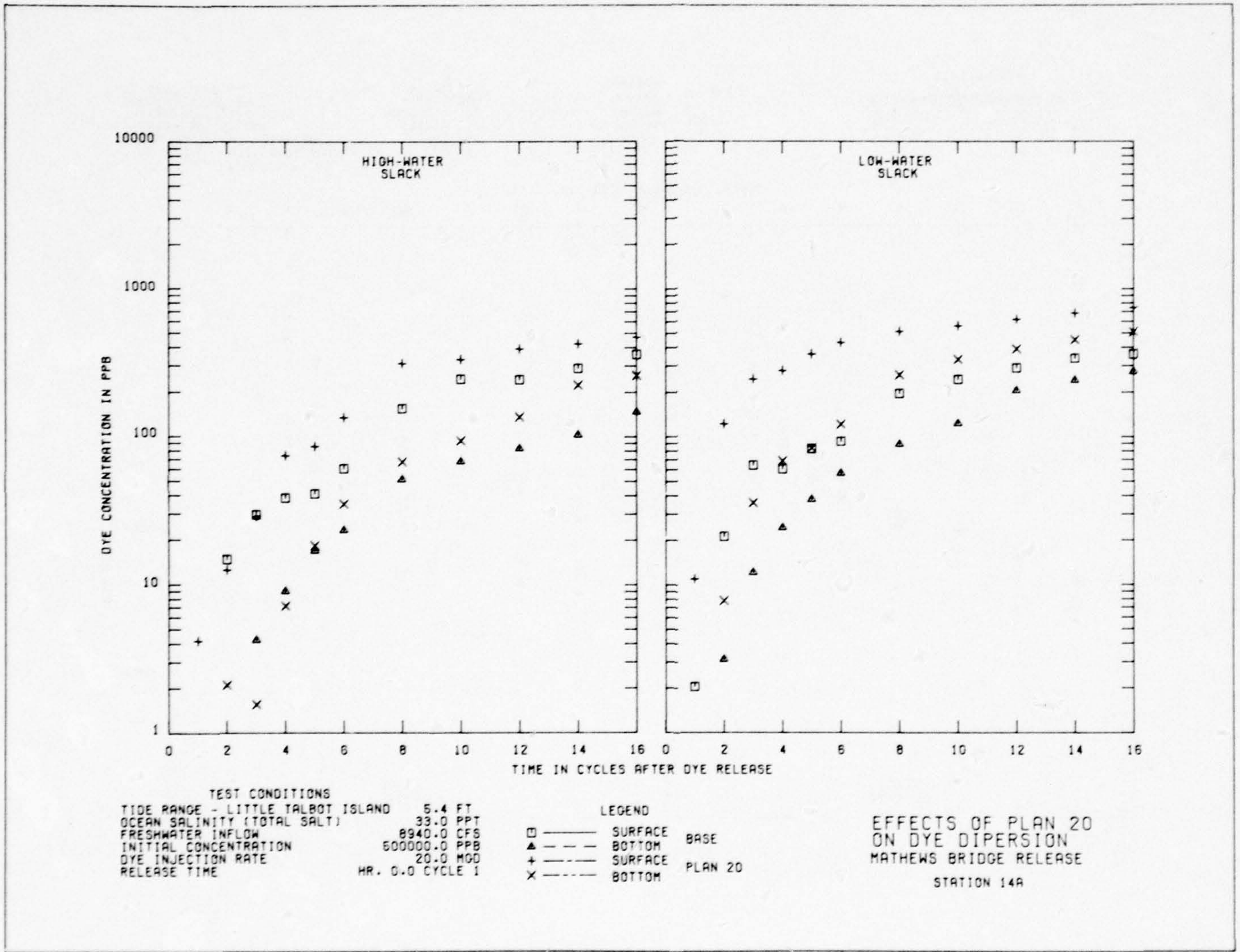
□ ———	SURFACE	BASE
△ — — —	BOTTOM	
+ —·—·—	SURFACE	PLAN 20
× —··—··—	BOTTOM	

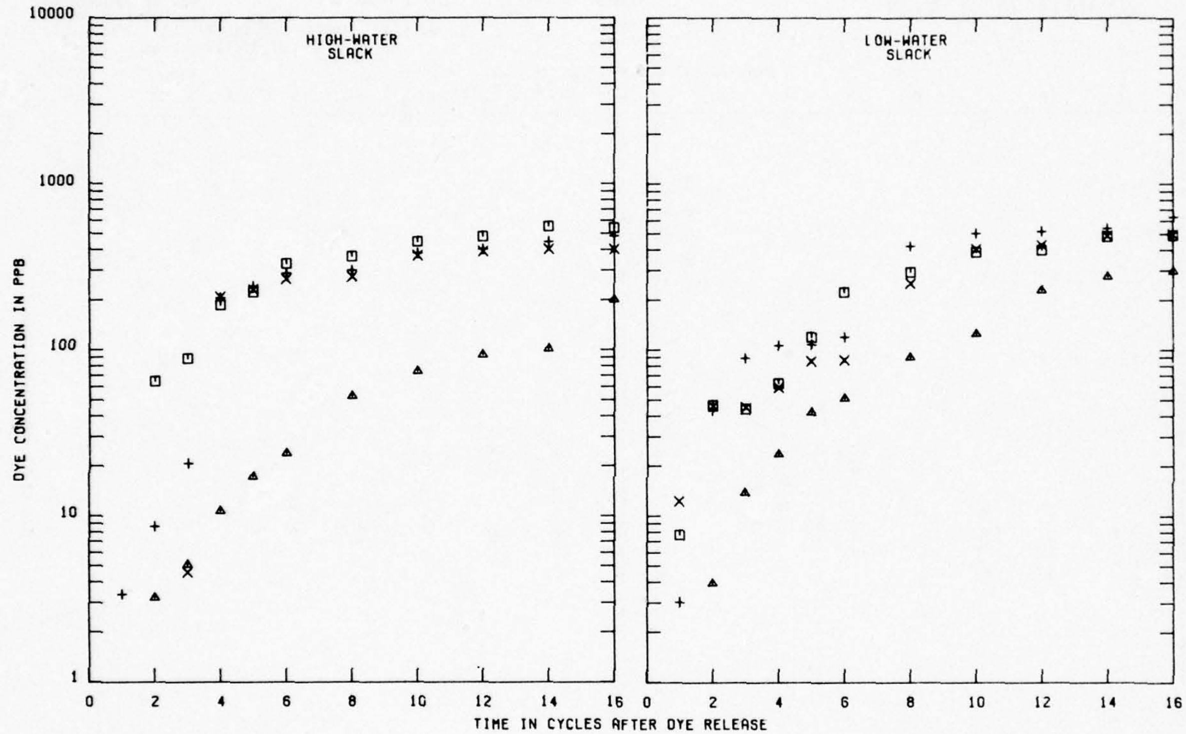
EFFECTS OF PLAN 20
ON DYE DIPERSION
MATHEWS BRIDGE RELEASE

STATION 11A

PLATE 233

PLATE 234


HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0 2 4 6 8 10 12 14 16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE BASE
BOTTOM
SURFACE PLAN 20
BOTTOM
EFFECTS OF PLAN 20
ON DYE DIPERSION
MATHEWS BRIDGE RELEASE
STATION 14A



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	20.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

⊡ ———	SURFACE	BASE
▲ — — —	BOTTOM	
+ —·—·—	SURFACE	PLAN 20
× —··—··—	BOTTOM	

EFFECTS OF PLAN 20
ON DYE DIPERSION
MATHEWS BRIDGE RELEASE

STATION 15A

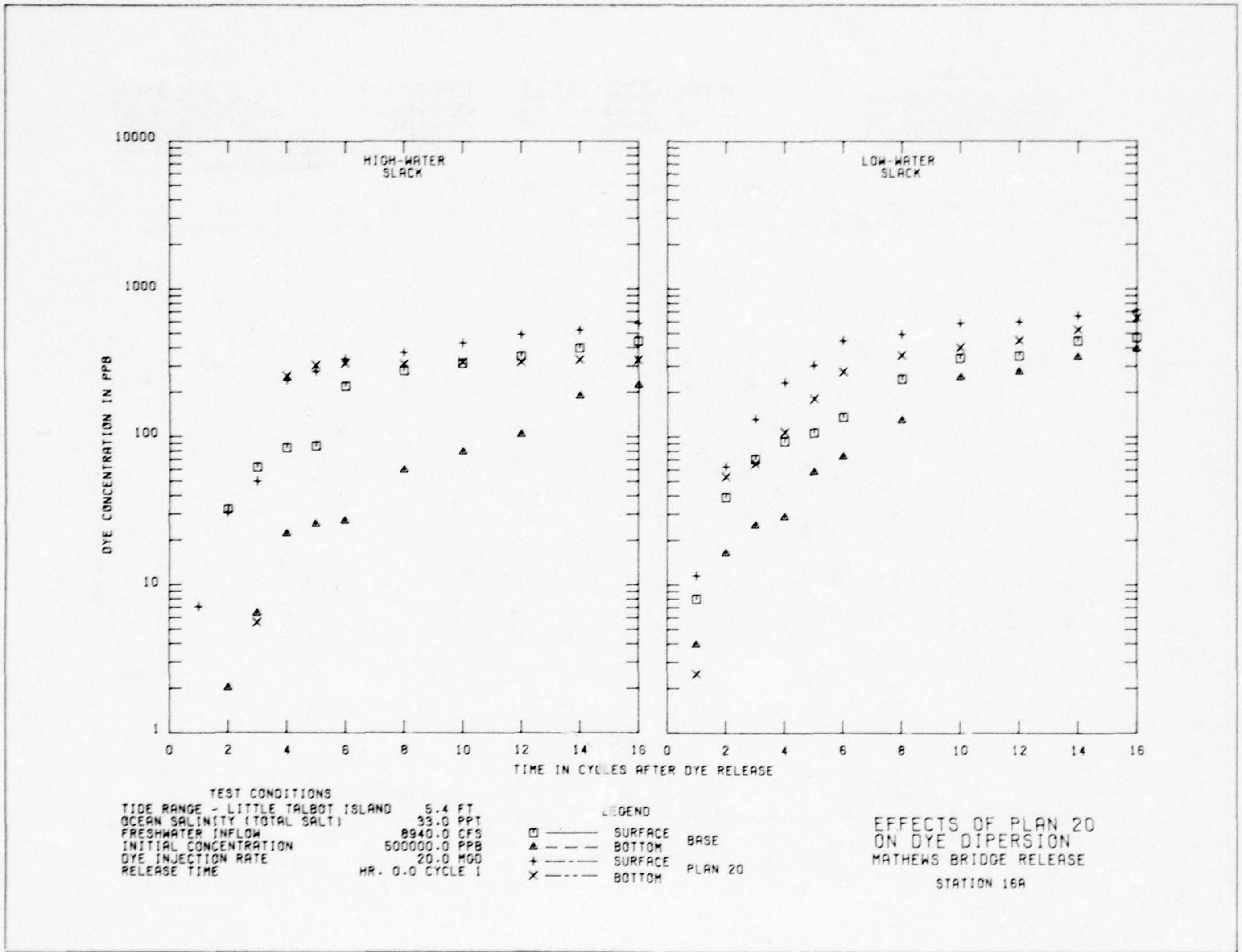
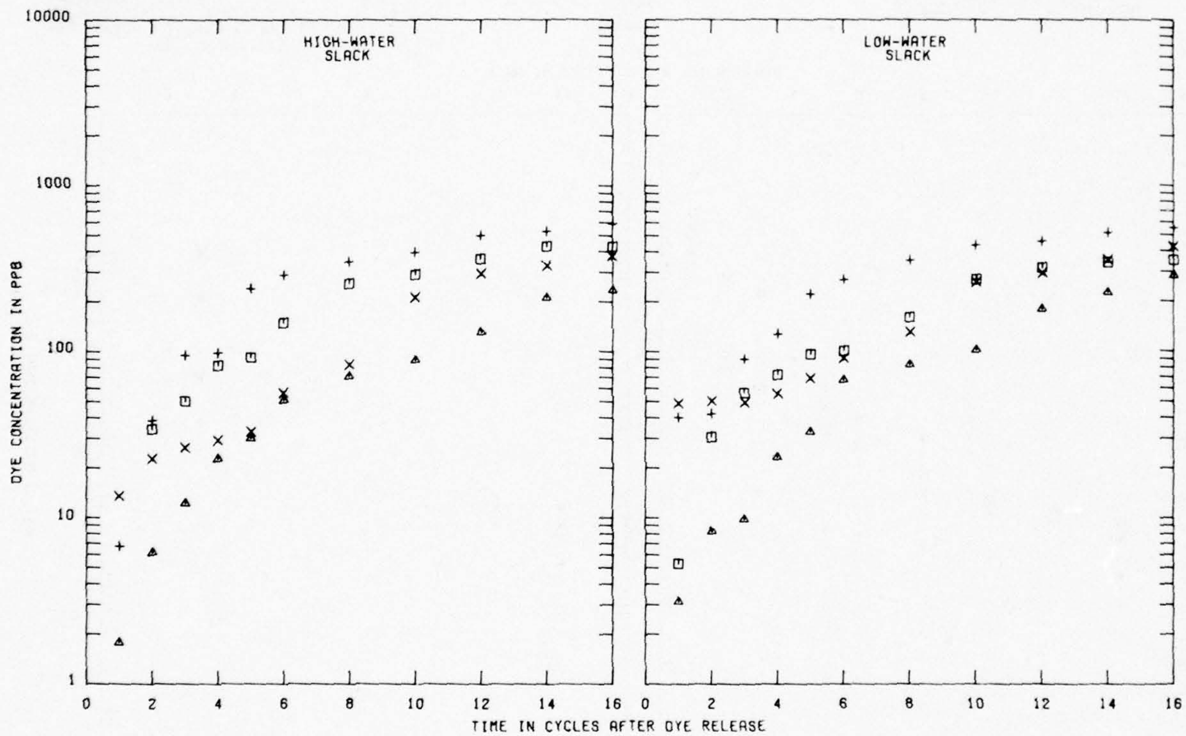

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 20
EFFECTS OF PLAN 20
ON DYE DIPERSION
MATHEWS BRIDGE RELEASE
STATION 16A

PLATE 236



TEST CONDITIONS

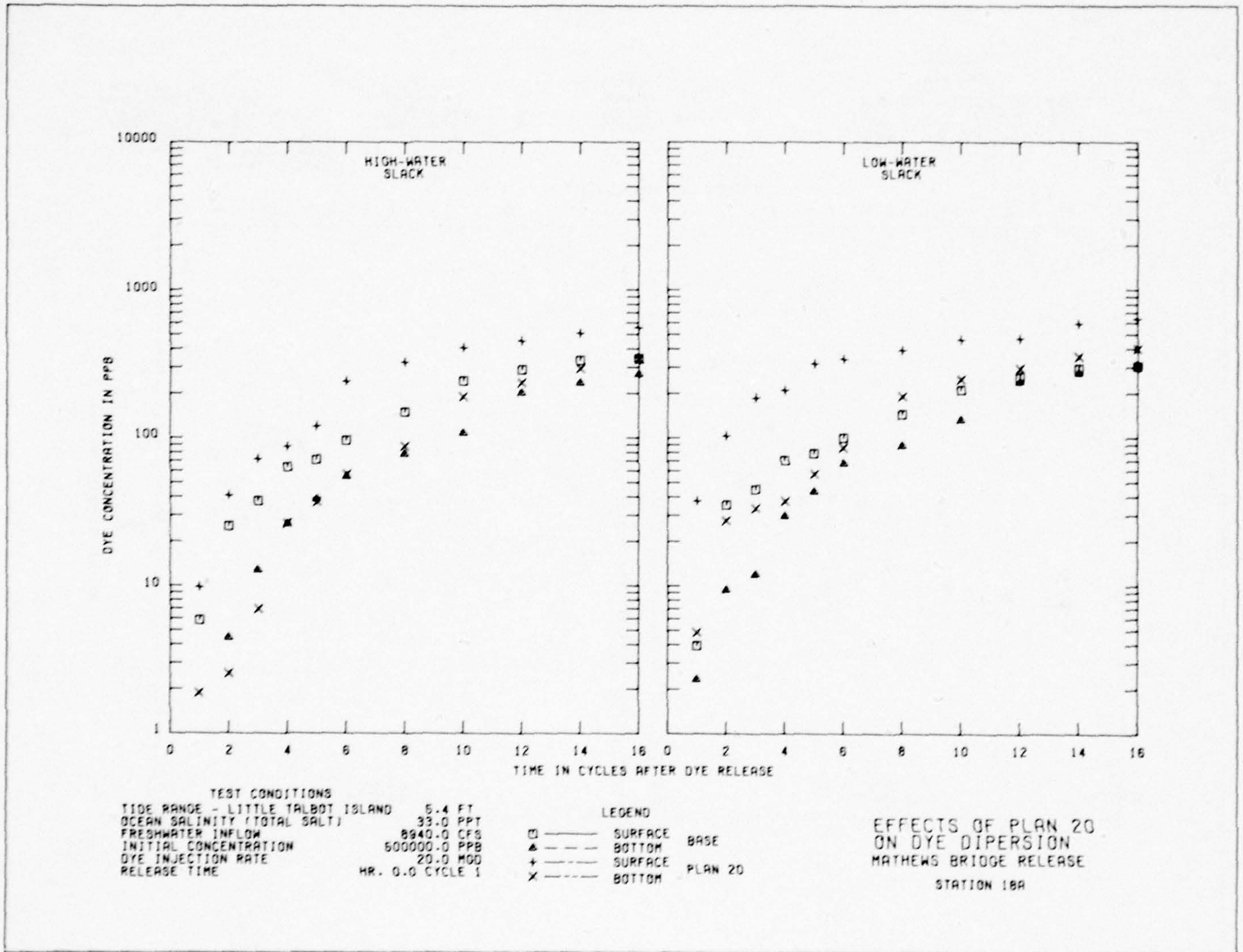
TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	20.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

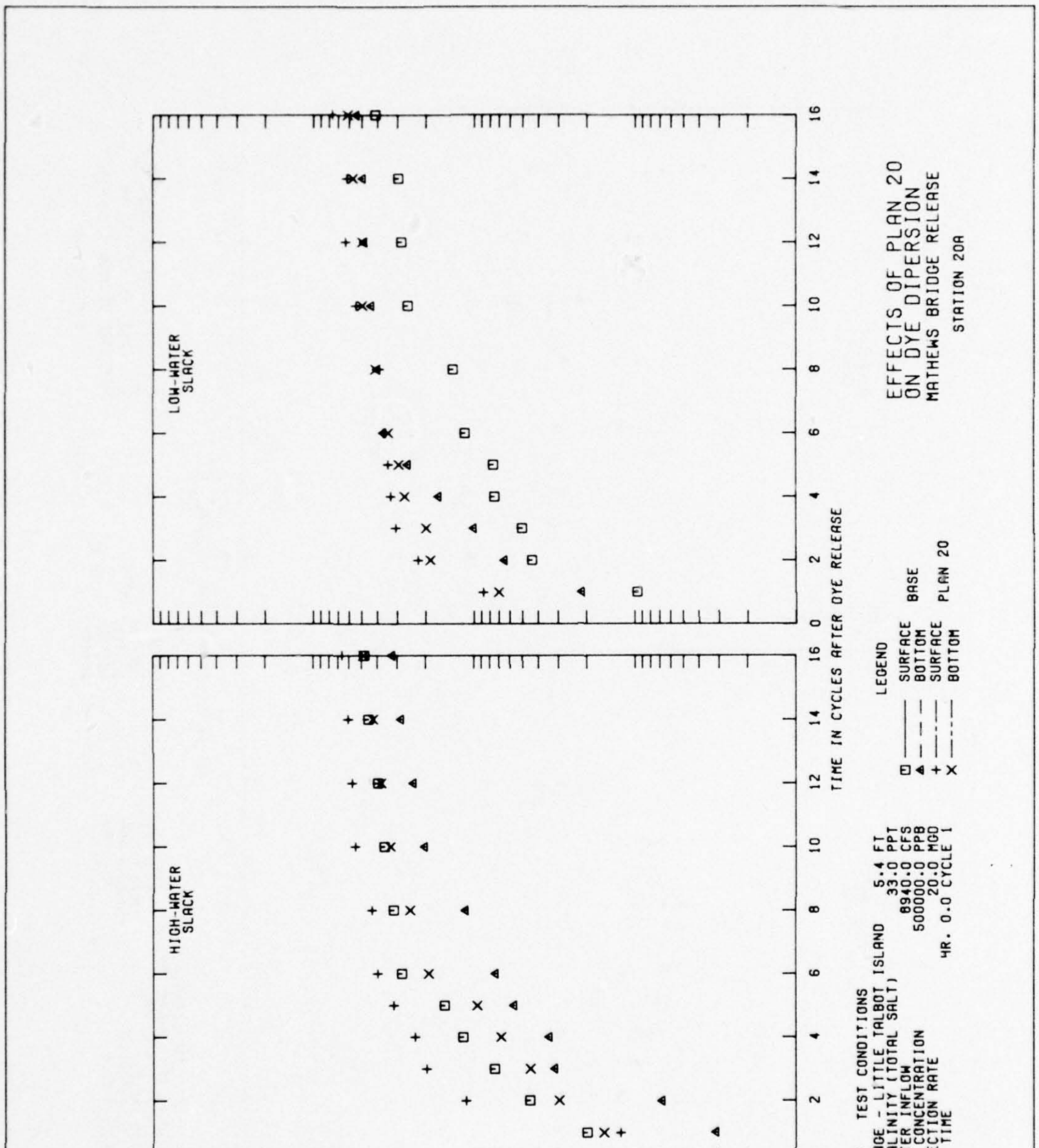
LEGEND

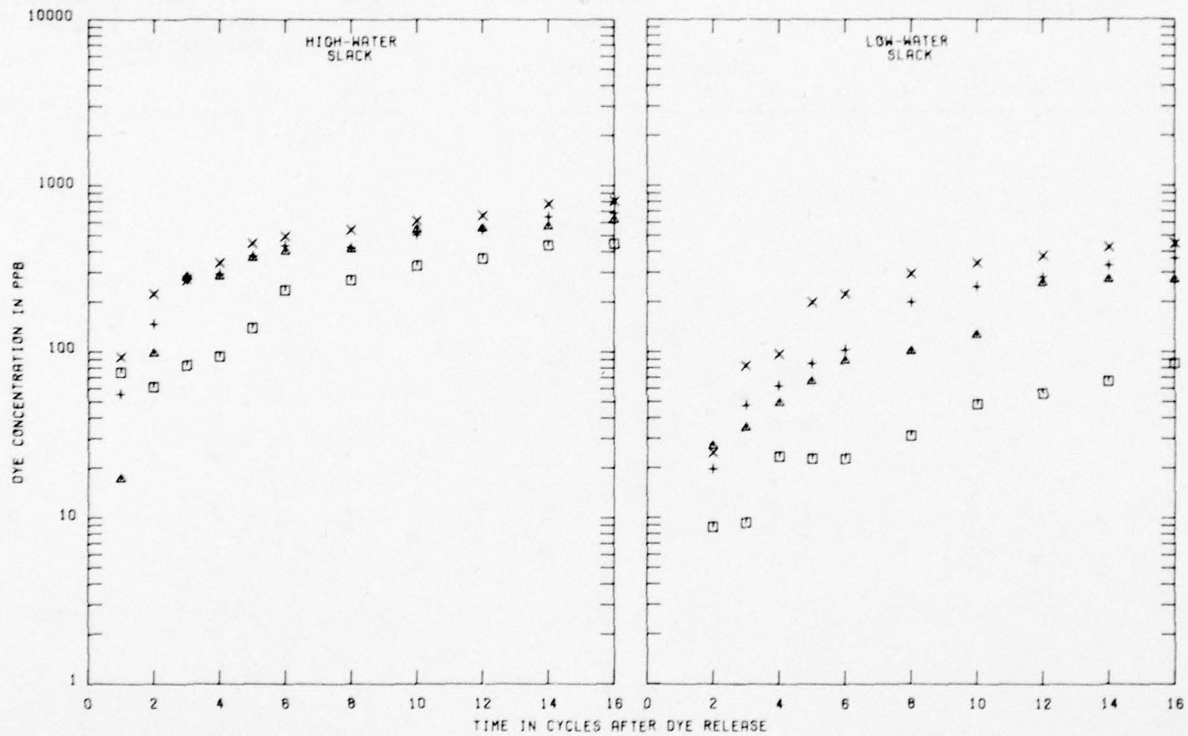
⊡ ———	SURFACE	BASE
△ — — —	BOTTOM	
+ —·—	SURFACE	PLAN 20
× —··—	BOTTOM	

EFFECTS OF PLAN 20
ON DYE DIPERSION
MATHEWS BRIDGE RELEASE

STATION 17A


HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0 2 4 6 8 10 12 14 16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE
BOTTOM
BASE
SURFACE
BOTTOM
PLAN 20
EFFECTS OF PLAN 20
ON DYE DIPERSION
MATHEWS BRIDGE RELEASE
STATION 18A


EFFECTS OF PLAN 20
ON DYE DIPERSION
MATHEWS BRIDGE RELEASE
STATION 20A
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE BASE
BOTTOM
SURFACE PLAN 20
BOTTOM



TEST CONDITIONS

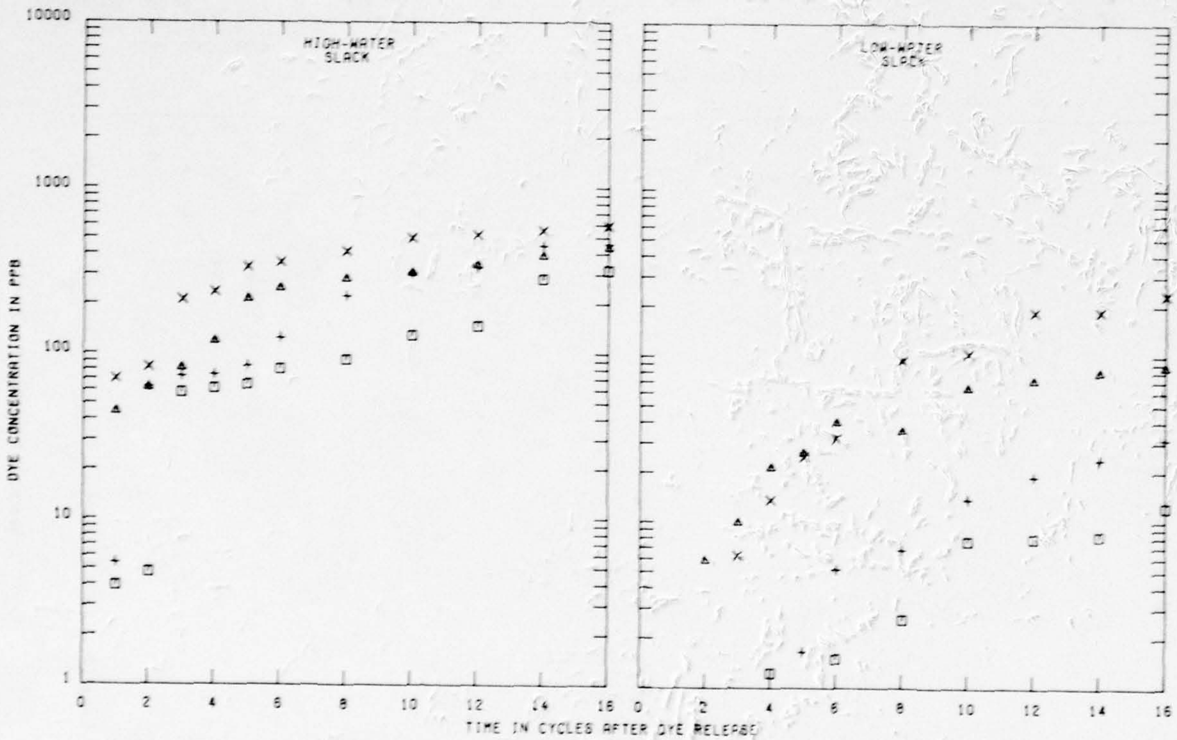
TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	20.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

□ SURFACE, △ BOTTOM — BASE
+ SURFACE, × BOTTOM — PLAN 20

EFFECTS OF PLAN 20
ON DYE DIPERSION
MATHEWS BRIDGE RELEASE

STATION 24A



TEST CONDITIONS

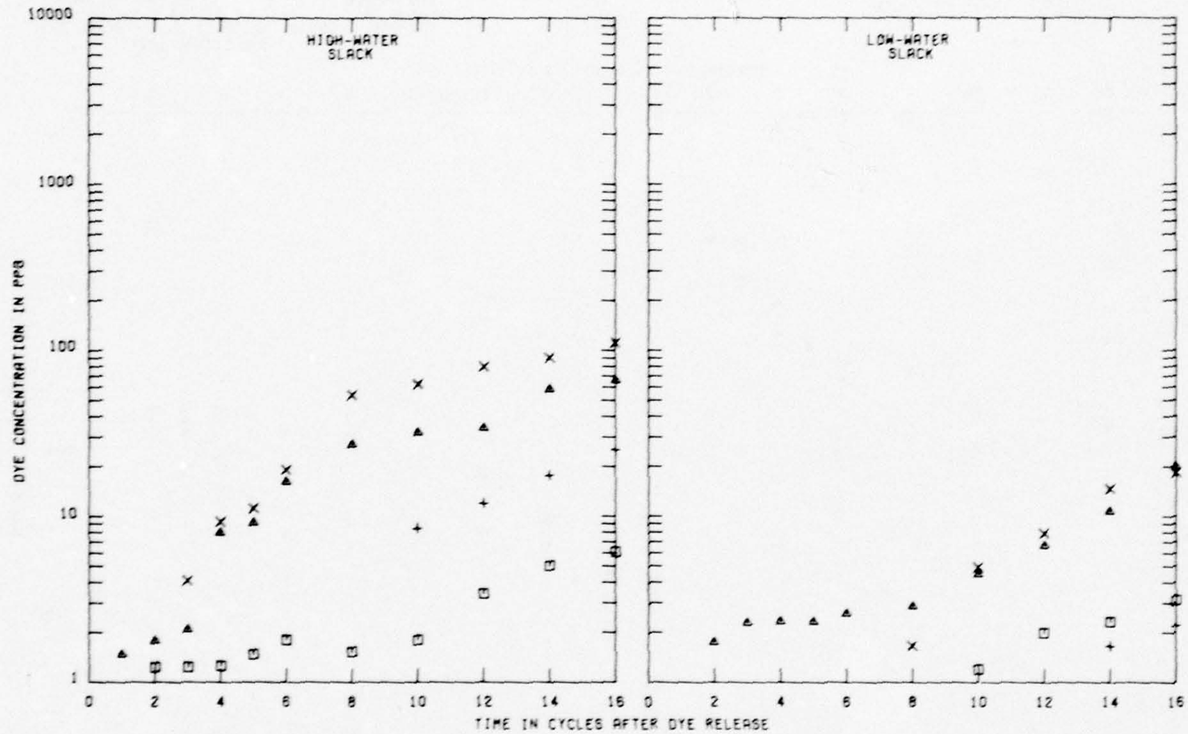
TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	20.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

□ ——— SURFACE BASE
△ — — — BOTTOM BASE
+ —·—·— SURFACE PLAN 20
× —··—··— BOTTOM PLAN 20

EFFECTS OF PLAN 20
ON DYE DIPERSION
MATHEWS BRIDGE RELEASE

STATION 28B



TEST CONDITIONS

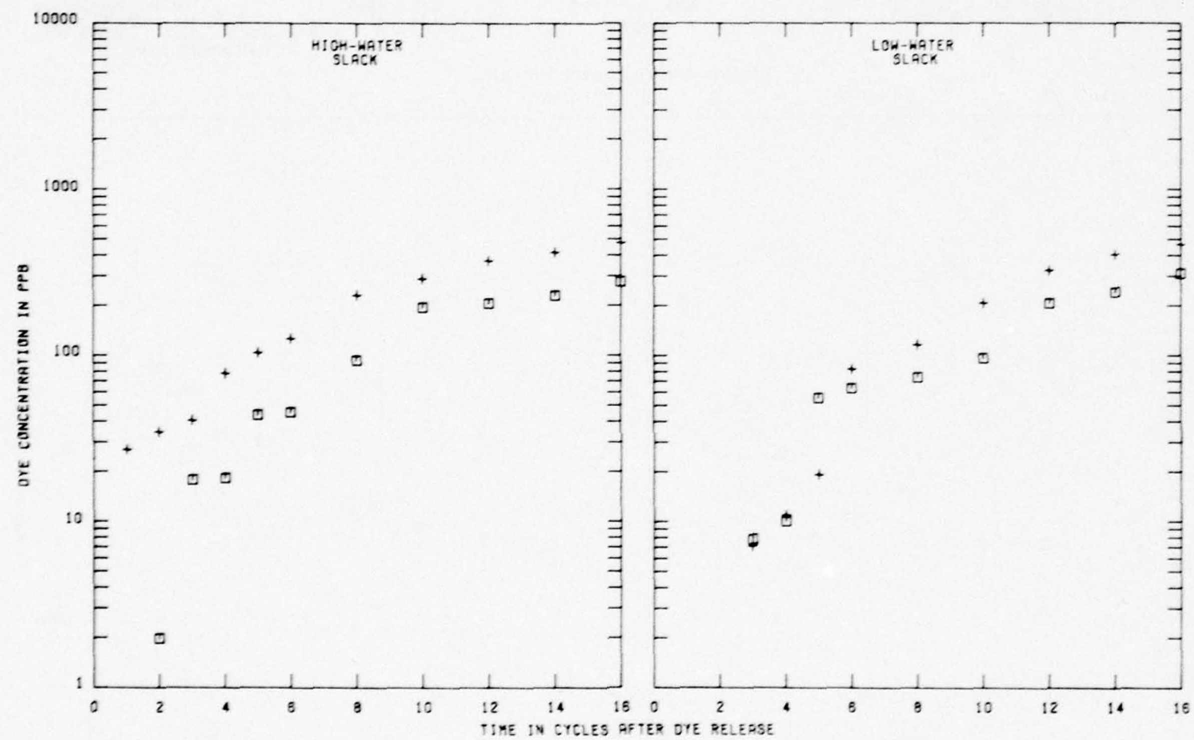
TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	20.0 MGD
RELEASE TIME	HR. 0.0 CYCLE I

LEGEND

□	SURFACE	BASE
▲	BOTTOM	
+	SURFACE	PLAN 20
×	BOTTOM	

EFFECTS OF PLAN 20
ON DYE DIPERSION
MATHEWS BRIDGE RELEASE

STATION 33A



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	5.4 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	8940.0 CFS
INITIAL CONCENTRATION	500000.0 PPB
DYE INJECTION RATE	20.0 MGD
RELEASE TIME	HR. 0.0 CYCLE 1

LEGEND

⊡ ——— BASE
\+ — — — PLAN 20

EFFECTS OF PLAN 20
ON DYE DIPERSION
MATHEWS BRIDGE RELEASE

STATION BRR MID-DEPTH

PLATE 243

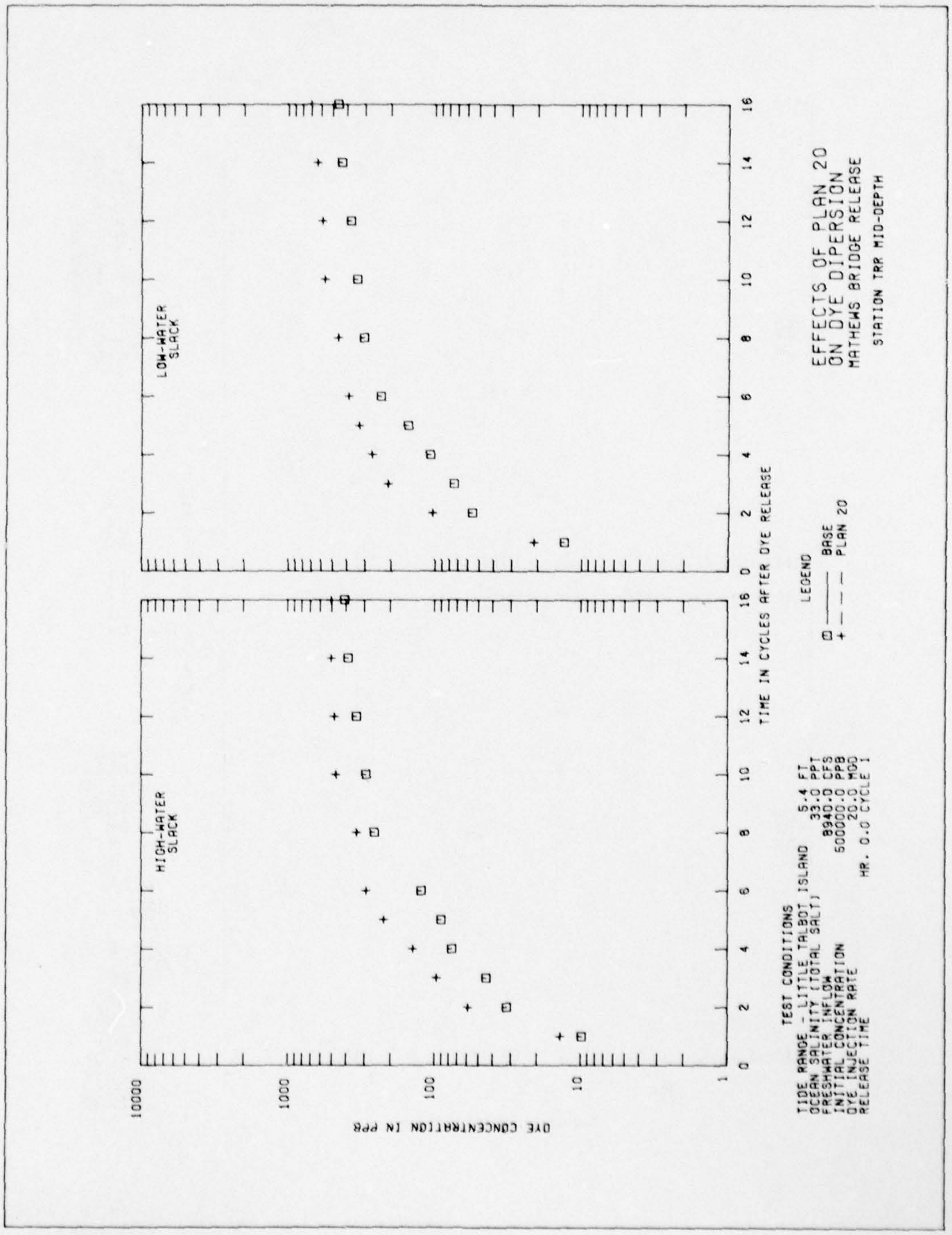
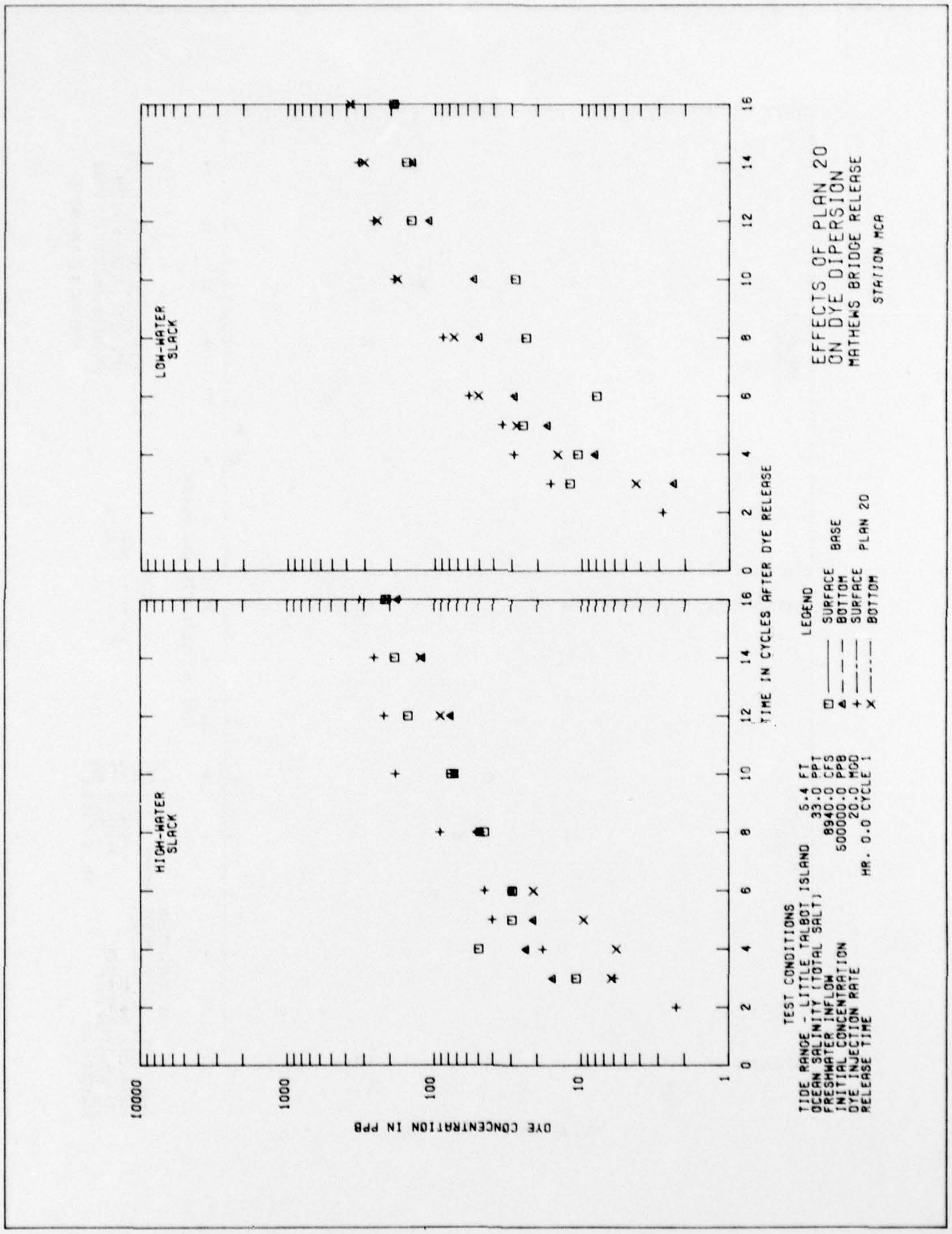

EFFECTS OF PLAN 20
ON DYE DIPERSION
MATHEWS BRIDGE RELEASE
STATION TRR MID-DEPTH
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
TIME IN CYCLES AFTER DYE RELEASE
LEGEND
BASE
PLAN 20
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1

PLATE 244



DYE CONCENTRATION IN PPB
10000
1000
100
10
1
HIGH-WATER SLACK
LOW-WATER SLACK
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
SURFACE BASE
BOTTOM
SURFACE PLAN 20
BOTTOM
EFFECTS OF PLAN 20
ON DYE DIPERSION
MATHEWS BRIDGE RELEASE
STATION MCA

PLATE 245

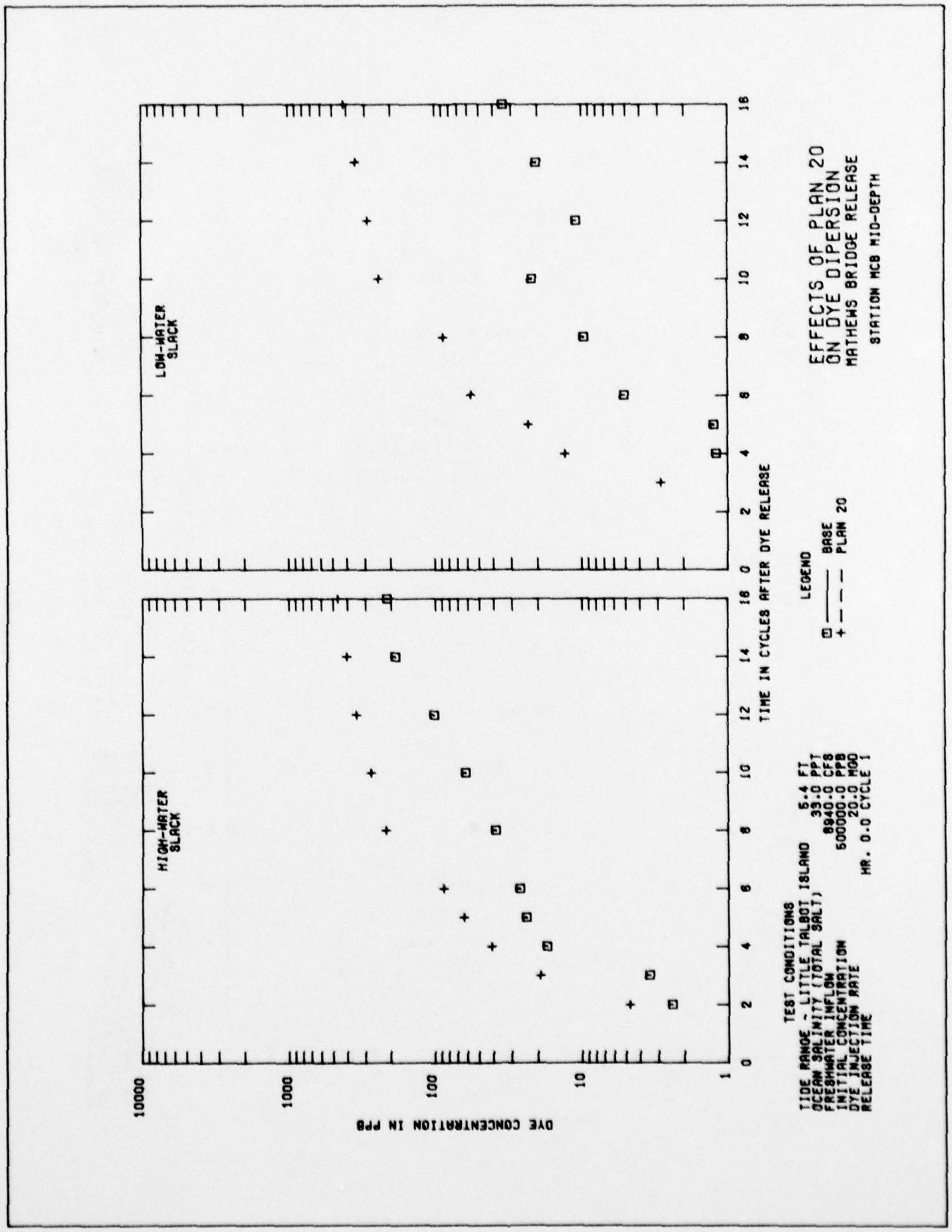

DYE CONCENTRATION IN PPB
10000
1000
100
10
1
HIGH-WATER SLACK
LOW-WATER SLACK
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
BASE
PLAN 20
EFFECTS OF PLAN 20
ON DYE DIPERSION
MATHEWS BRIDGE RELEASE
STATION MCB MID-DEPTH

PLATE 246

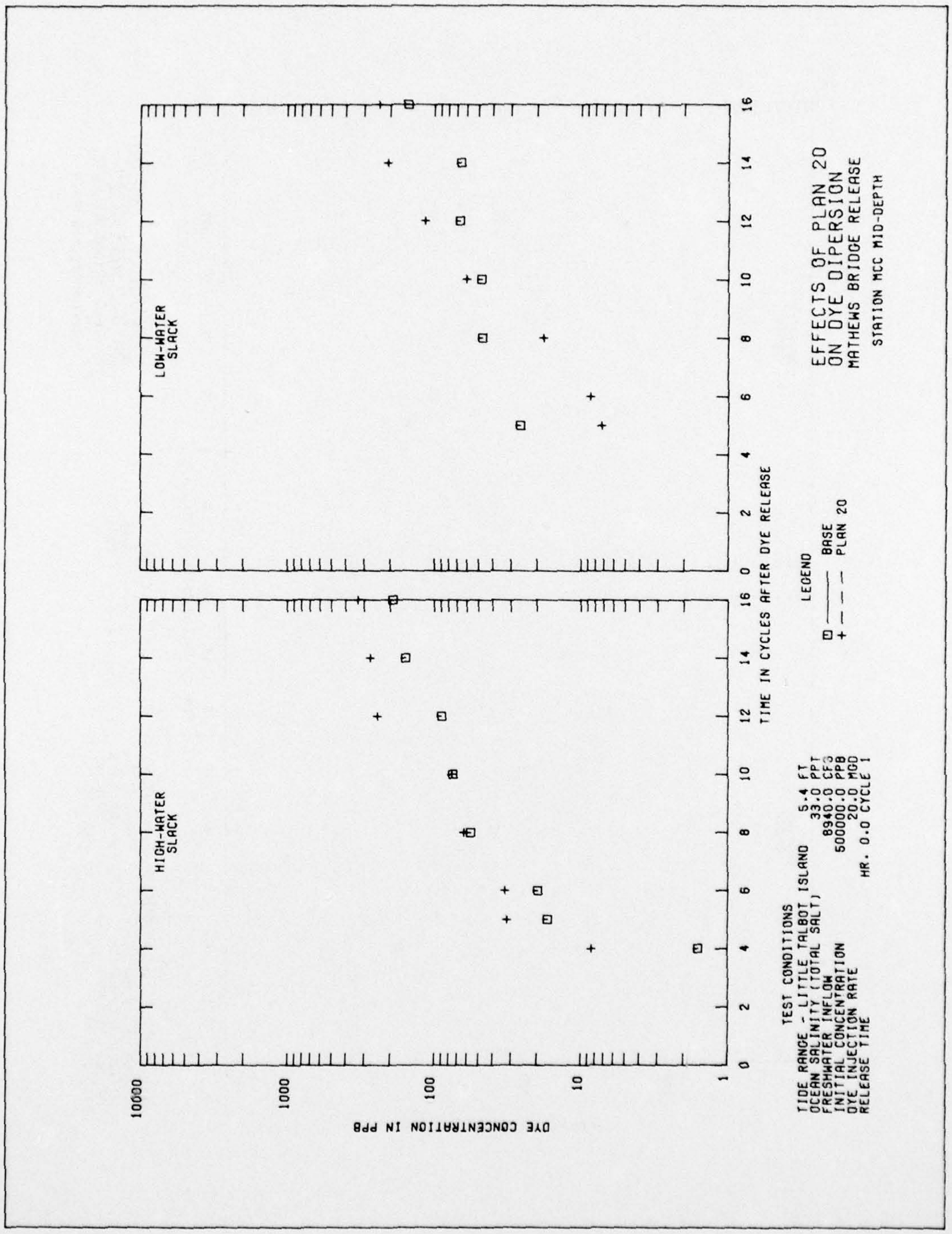
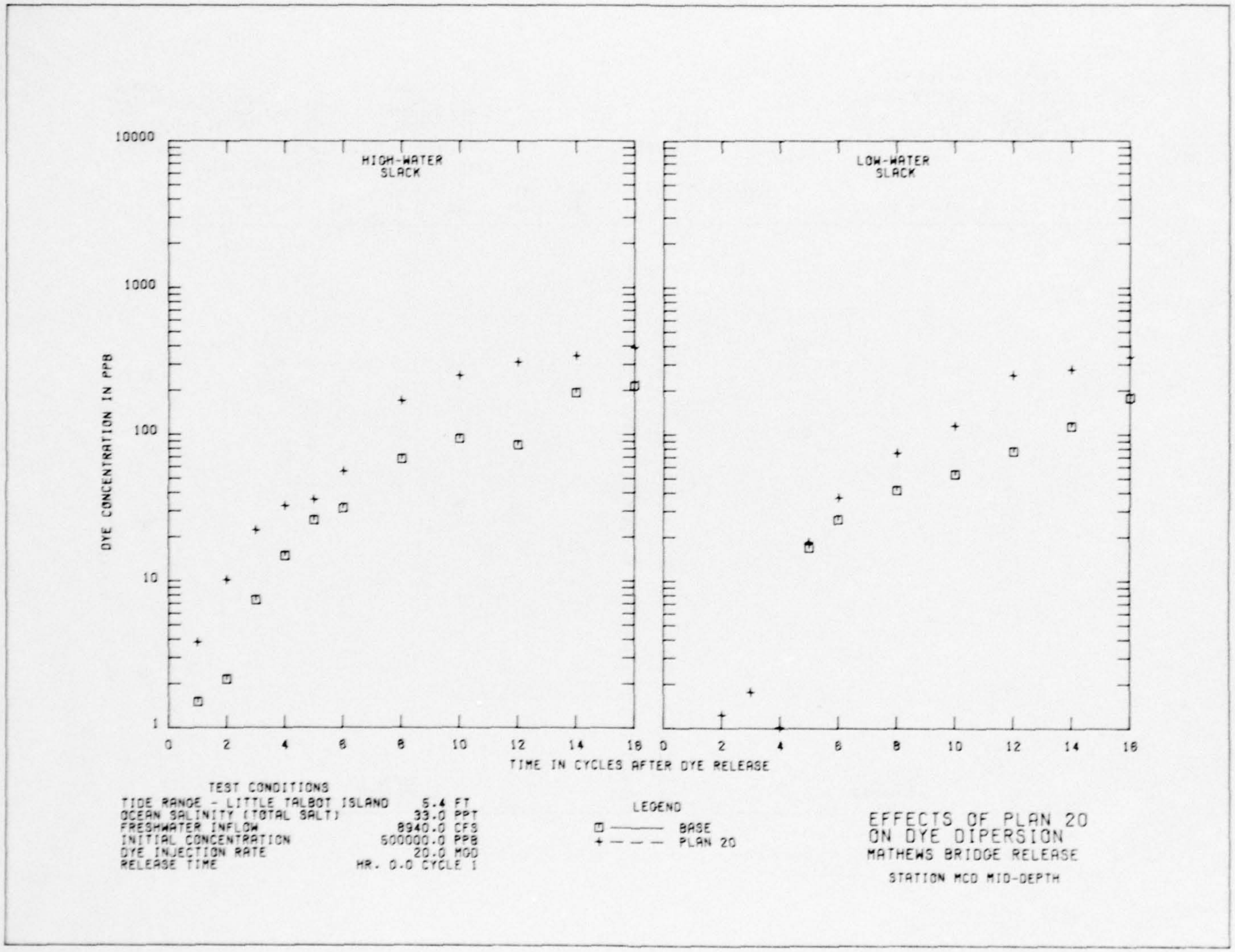
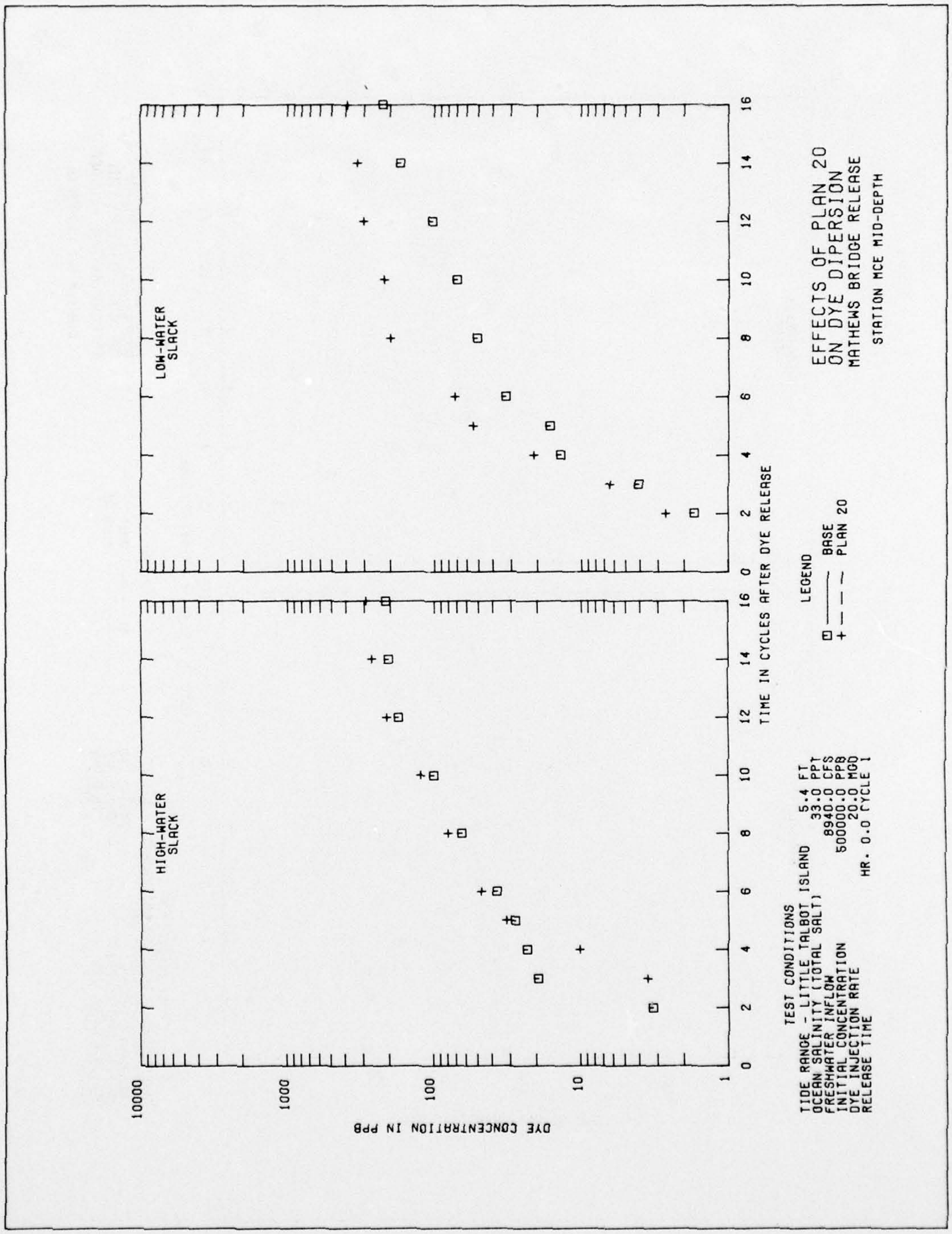

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0 2 4 6 8 10 12 14 16
TIME IN CYCLES AFTER DYE RELEASE
LEGEND
BASE
PLAN 20
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MOD
RELEASE TIME HR. 0.0 CYCLE 1
EFFECTS OF PLAN 20
ON DYE DIPERSION
MATHEWS BRIDGE RELEASE
STATION MCC MID-DEPTH

PLATE 247

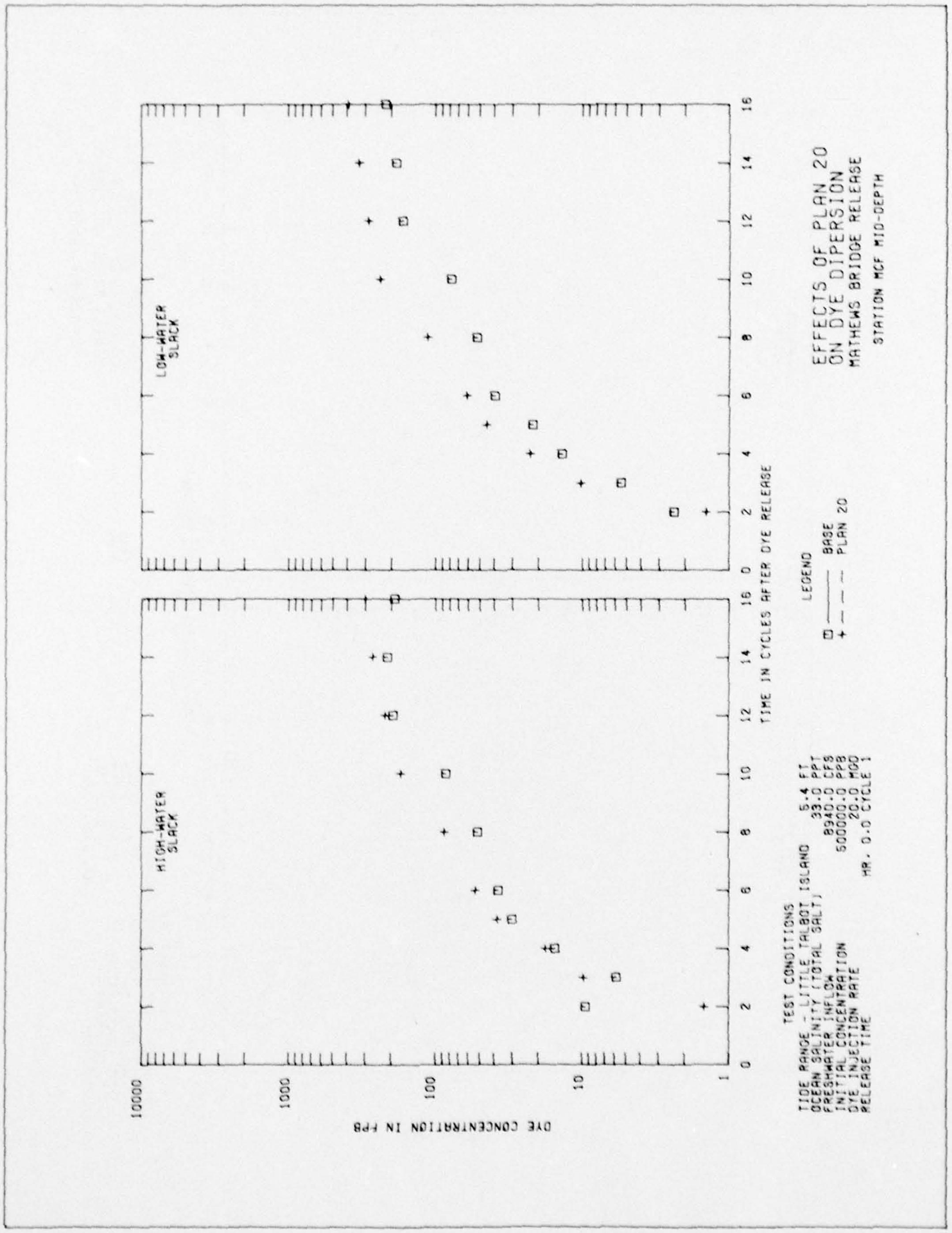


HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0 2 4 6 8 10 12 14 16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 600000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
BASE
PLAN 20
EFFECTS OF PLAN 20
ON DYE DIPERSION
MATHEWS BRIDGE RELEASE
STATION MCD MID-DEPTH

PLATE 248



HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
BASE
PLAN 20
EFFECTS OF PLAN 20
ON DYE DIPERSION
MATHEWS BRIDGE RELEASE
STATION MCE MID-DEPTH



EFFECTS OF PLAN 20
ON DYE DIPERSION
MATHEWS BRIDGE RELEASE
STATION MCF MID-DEPTH
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
TIME IN CYCLES AFTER DYE RELEASE
LEGEND
BASE
PLAN 20
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1

PLATE 250

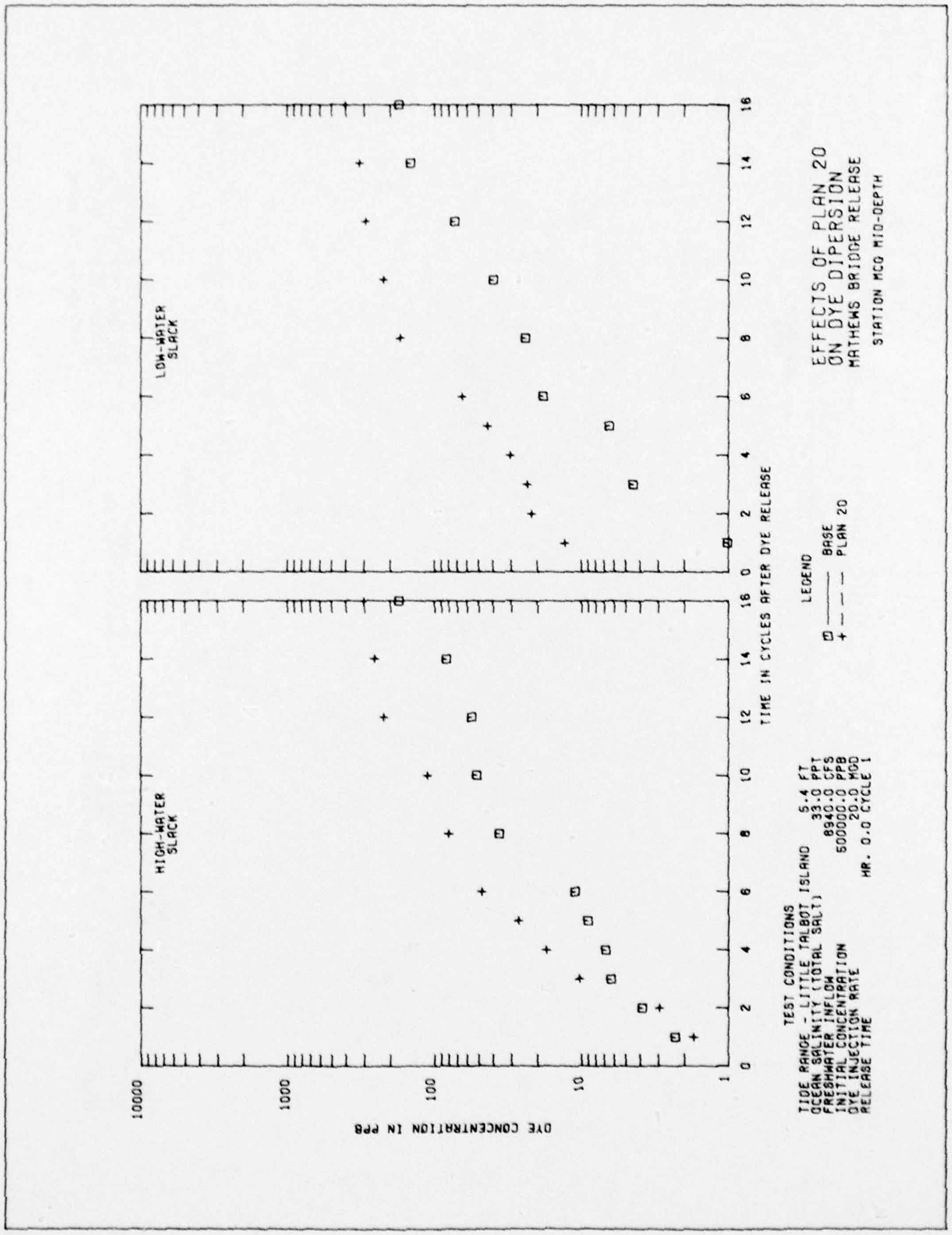
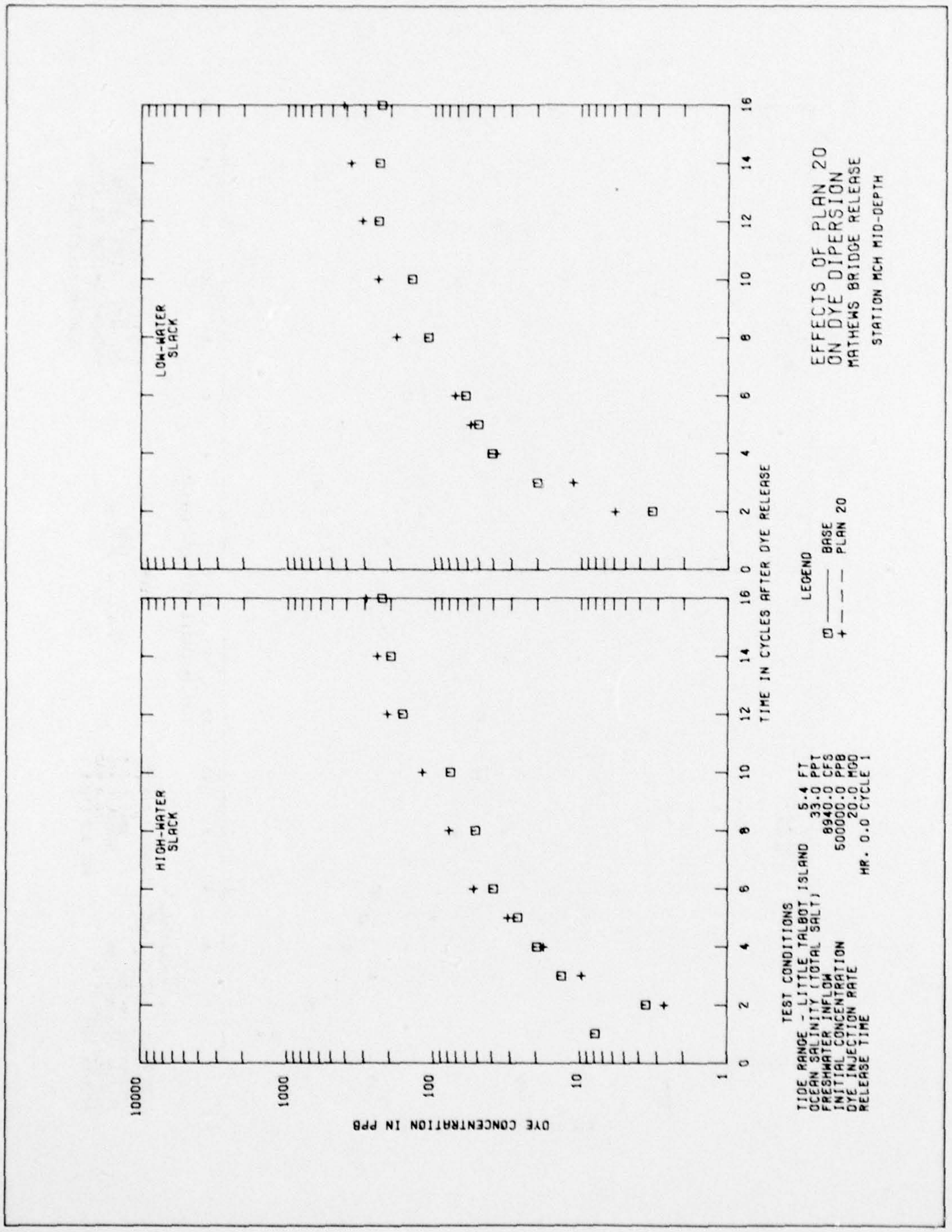

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
BASE
PLAN 20
EFFECTS OF PLAN 20
ON DYE DIPERSION
MATHEWS BRIDGE RELEASE
STATION MCO MID-DEPTH

PLATE 251



EFFECTS OF PLAN 20
ON DYE DIPERSION
MATHEWS BRIDGE RELEASE
STATION MCH MID-DEPTH
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
LEGEND
BASE
PLAN 20
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1

PLATE 252

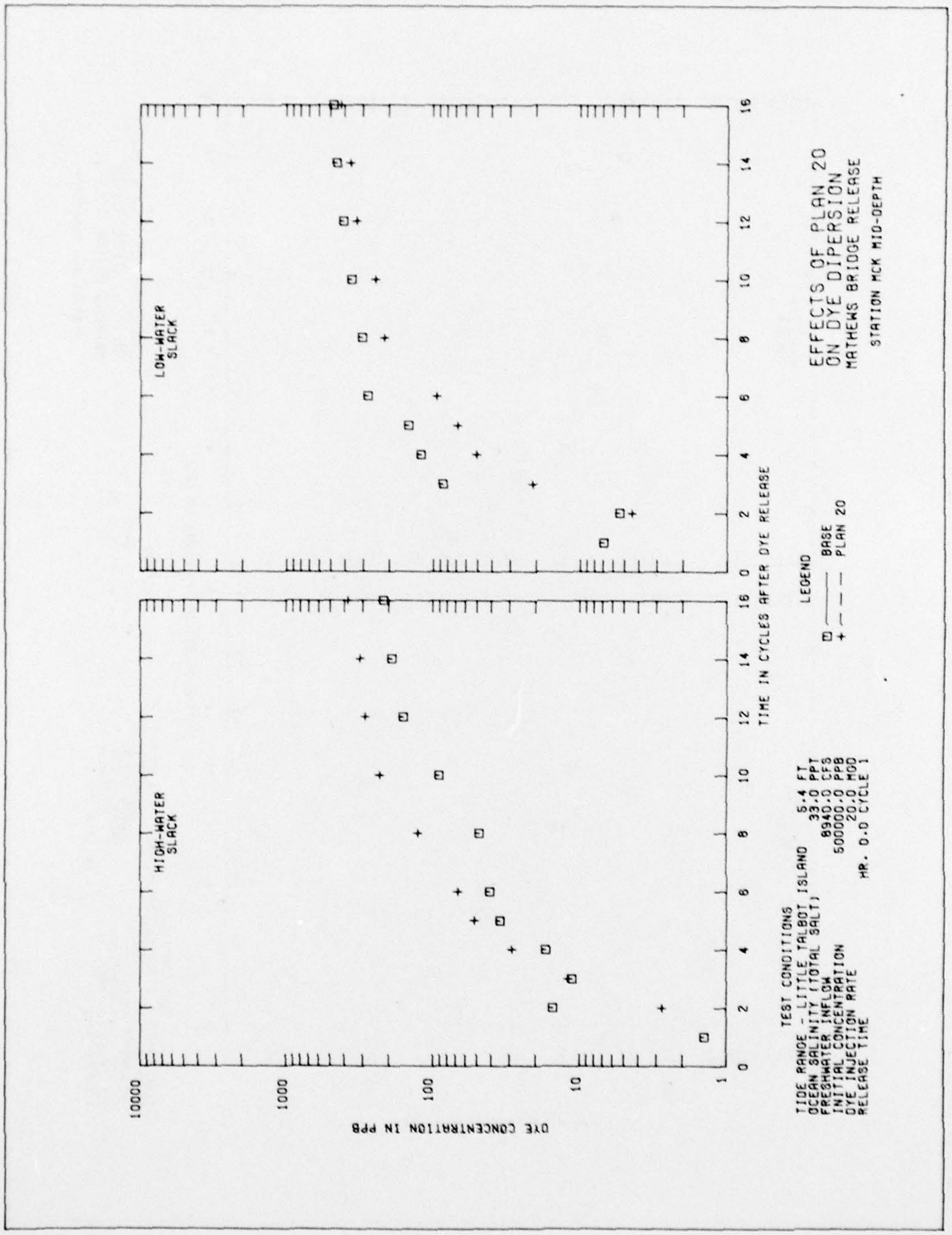

EFFECTS OF PLAN 20
ON DYE DIPERSION
MATHEWS BRIDGE RELEASE
STATION MCK MID-DEPTH
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
TIME IN CYCLES AFTER DYE RELEASE
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
LEGEND
BASE
PLAN 20
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MOD
RELEASE TIME HR. 0.0 CYCLE 1

PLATE 253

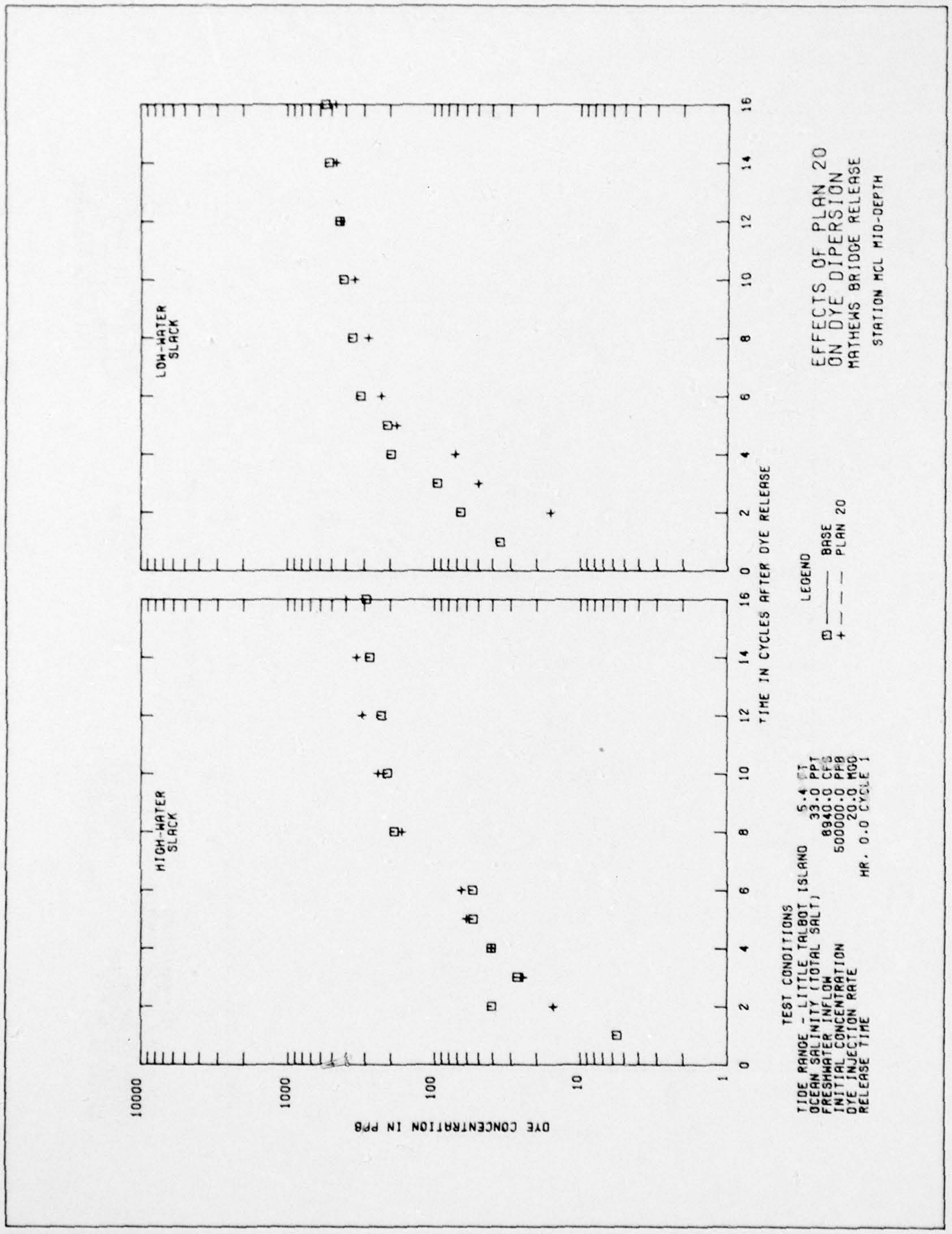

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
LEGEND
BASE
PLAN 20
EFFECTS OF PLAN 20
ON DYE DIPERSION
MATHEWS BRIDGE RELEASE
STATION MCL MID-DEPTH
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1

PLATE 254

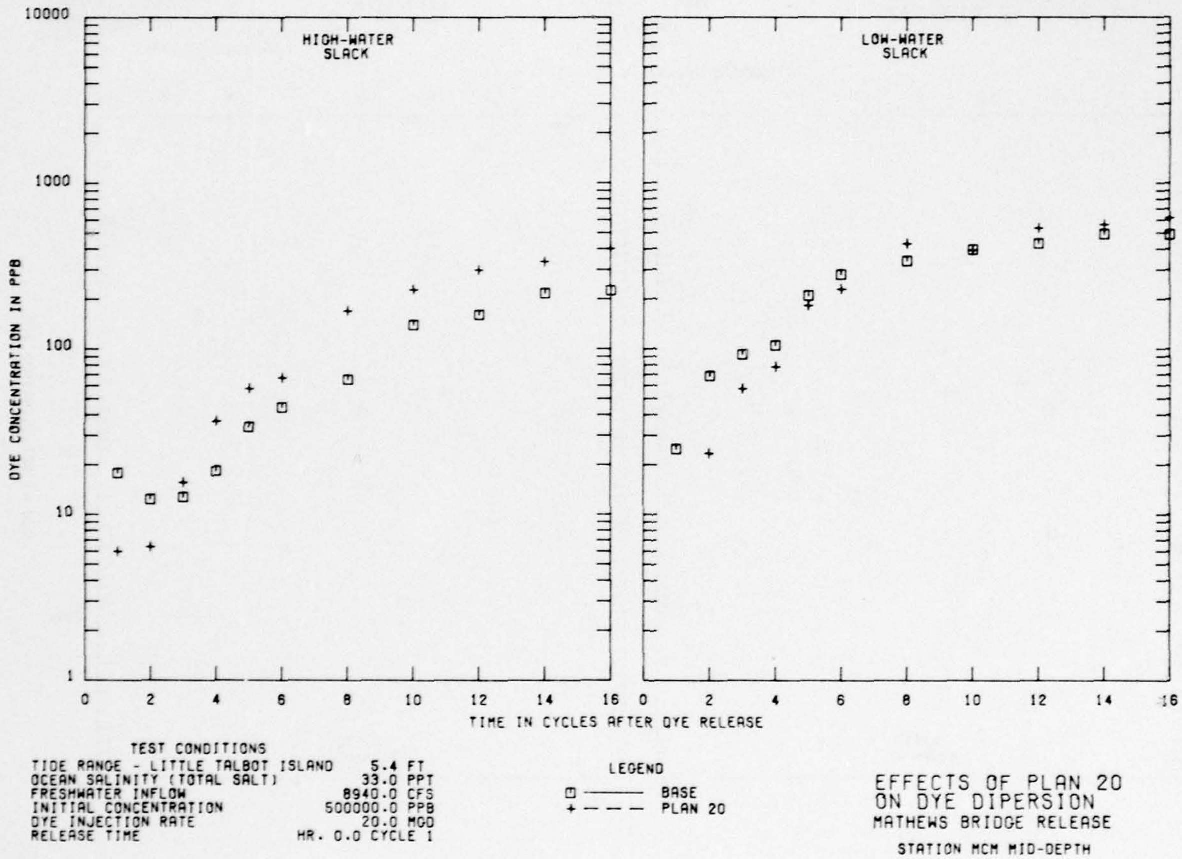
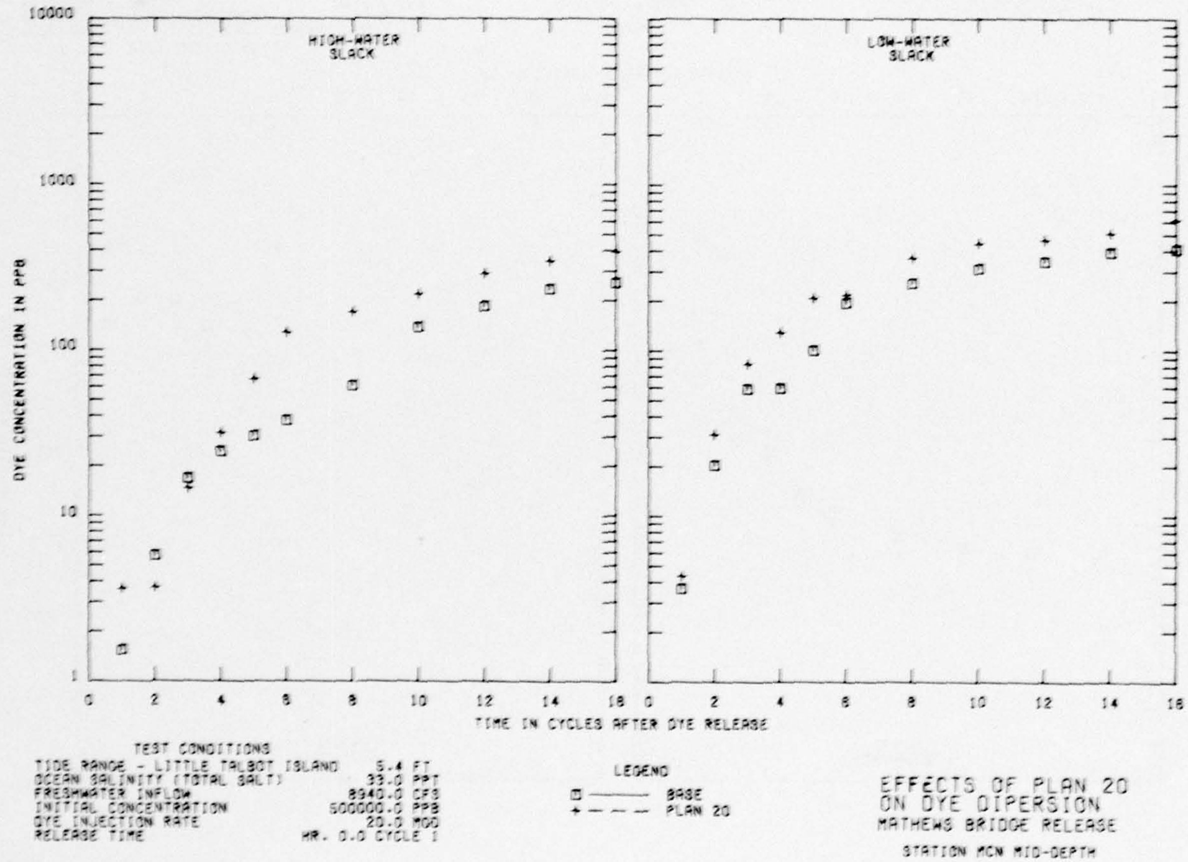

HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
BASE
PLAN 20
EFFECTS OF PLAN 20
ON DYE DIPERSION
MATHEWS BRIDGE RELEASE
STATION MCM MID-DEPTH

PLATE 255



HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
10000
1000
100
10
1
0 2 4 6 8 10 12 14 16
TIME IN CYCLES AFTER DYE RELEASE
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
BASE
PLAN 20
EFFECTS OF PLAN 20
ON DYE DIPERSION
MATHEWS BRIDGE RELEASE
STATION MCN MID-DEPTH

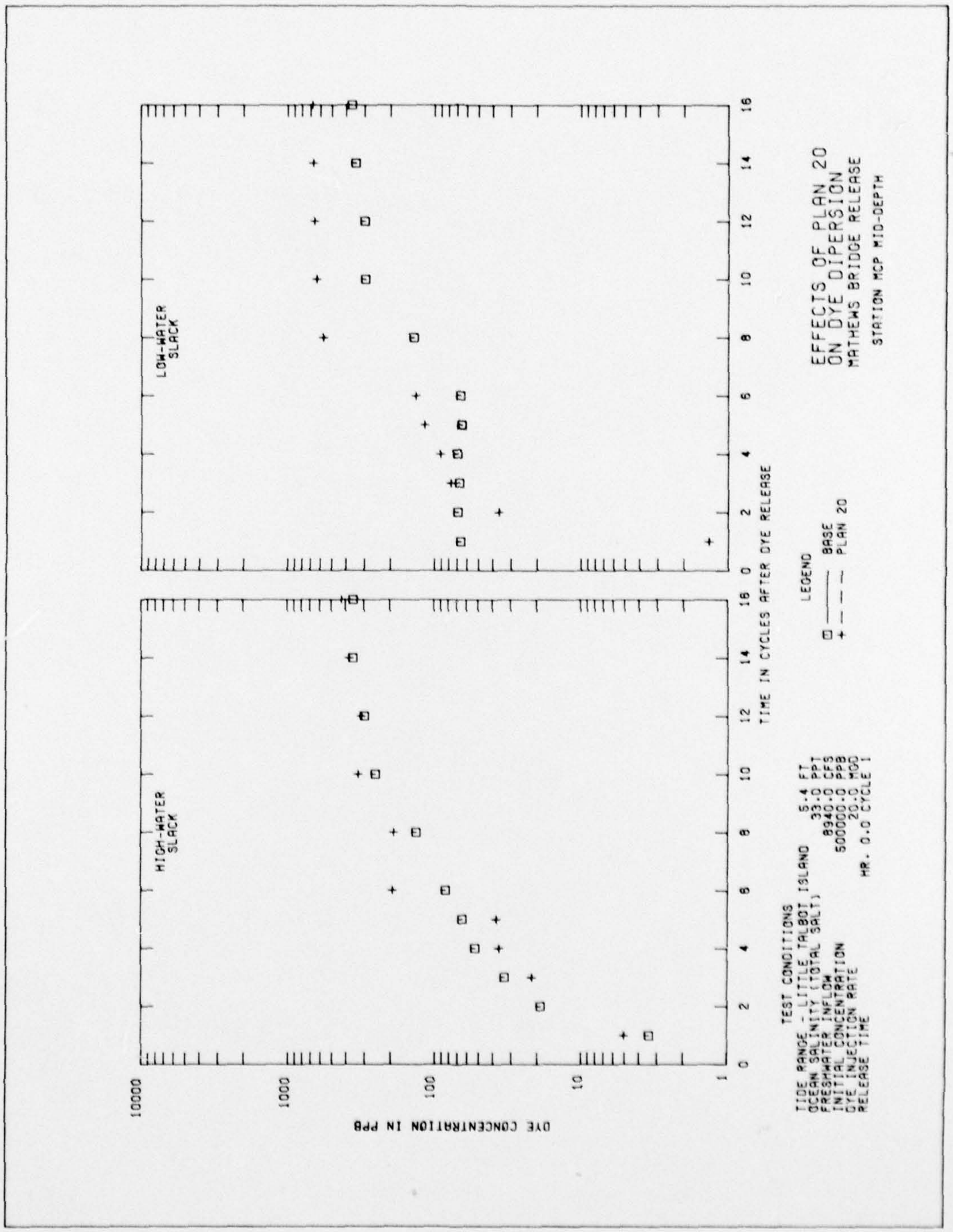

EFFECTS OF PLAN 20
ON DYE DIPERSION
MATHEWS BRIDGE RELEASE
STATION MCP MID-DEPTH
HIGH-WATER SLACK
LOW-WATER SLACK
DYE CONCENTRATION IN PPB
TIME IN CYCLES AFTER DYE RELEASE
10000
1000
100
10
1
0
2
4
6
8
10
12
14
16
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
INITIAL CONCENTRATION 500000.0 PPB
DYE INJECTION RATE 20.0 MGD
RELEASE TIME HR. 0.0 CYCLE 1
LEGEND
BASE
PLAN 20

PLATE 257

In accordance with letter from DAEN-RDC, DAEN-ASI dated 22 July 1977, Subject: Facsimile Catalog Cards for Laboratory Technical Publications, a facsimile catalog card in Library of Congress MARC format is reproduced below.

Brogdon, Noble J
  Mayport-Mill Cove model study; Report 3: Mill Cove Study; hydraulic model investigation / by Noble J. Brogdon, Jr., Joseph W. Parman. Vicksburg, Miss. : U. S. Waterways Experiment Station ; Springfield, Va. : available from National Technical Information Service, 1979.
  111, [69] p., 257 leaves of plates : ill. ; 27 cm. (Technical report - U. S. Army Engineer Waterways Experiment Station ; HL-79-12, Report 3)
  Prepared for U. S. Army Engineer District, Jacksonville, Jacksonville, Florida.

1. Fixed-bed models. 2. Flushing. 3. Hydraulic models. 4. Mayport-Mill Cove. 5. Mill Cove. I. Parman, Joseph W., joint author. II. United States. Army. Corps of Engineers. Jacksonville District. III. Series: United States. Waterways Experiment Station, Vicksburg, Miss. Technical report ; HL-79-12, Report 3.
TA7.W34 no.HL-79-12 Report 3